Vol. XVIII. 1920. Part 5.

[Registered at the General Post Office, Melbourne, for transmission by Post as a Newspaper.]

The Journal of the Department of Agriculture of Victoria, Australia.

May, 1920.

PRINCIPAL CONTENTS

Flax and Its Cultivation

Government Certification of Stallions

Report for 1919-20

Branding and Ear-Marking Stock

Poultry Parasites

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VICTORIA, AUSTRALIA.

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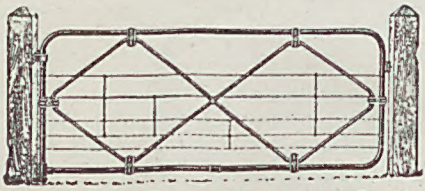

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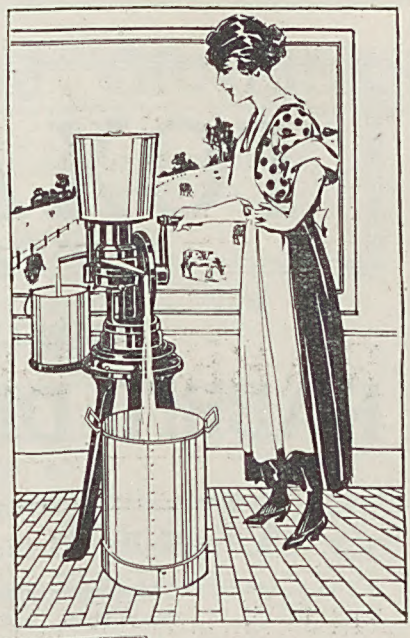

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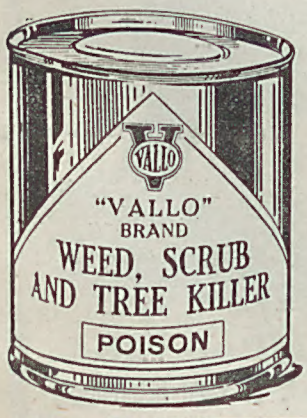

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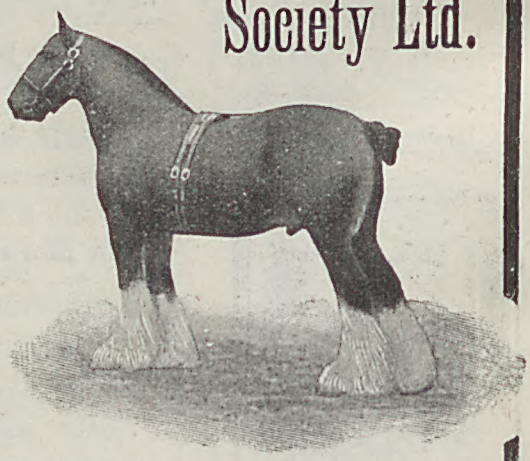

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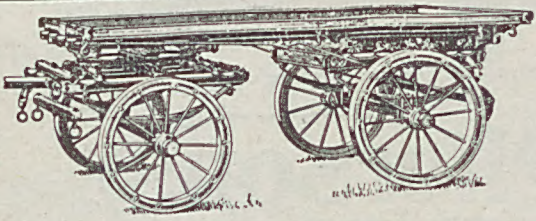

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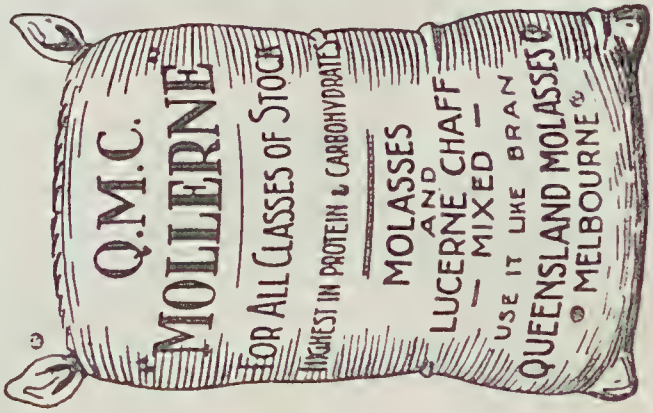

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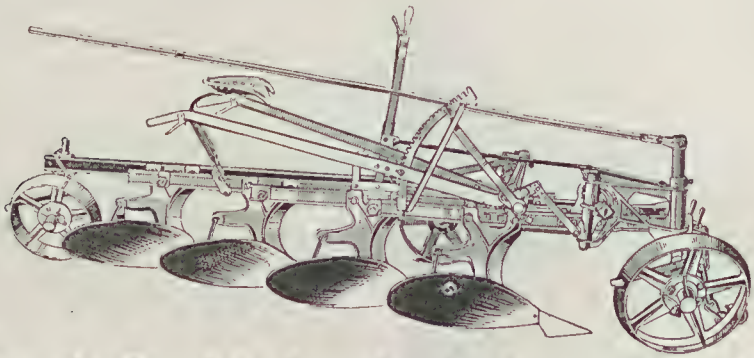

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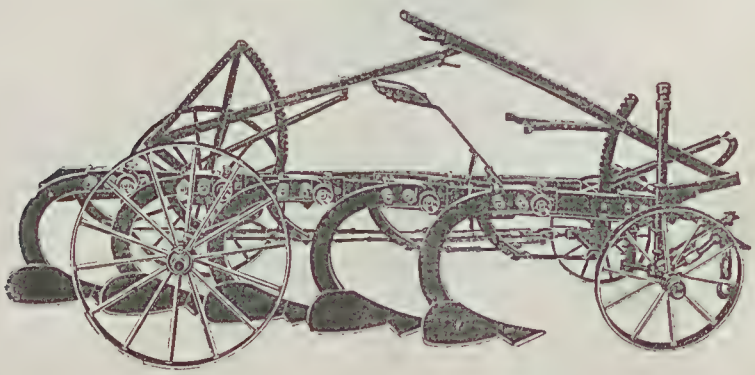

THE JOURNAL

OF THE

Department of Agriculture

OF

VICTORIA.

Vol. XVIII. 15th May, 1920 Part 5.

FLAX AND ITS CULTIVATION.

P. Ryan, B. Ag. Sc., Acting Secretary, Commonwealth Flax Committee.

For the past twenty years or more flax for fibre has been grown on a limited scale in the Gippsland District of Victoria, and attempts have also been made to establish its cultivation in other States, but owing to the low price of fibre the returns obtained were not sufficiently lucrative to induce farmers to grow flax in preference to the other farm crops.

In order to stimulate the production of flax products, the Commonwealth Government, under the Bounties Act of 1907, granted a bounty of 10 per cent. on the market value of all fibre and linseed produced in Australia, but this Act was not largely availed of, and did not result in any material increase in the acreage sown. When the Bounties Act was allowed to lapse in 1917, the area devoted to flax in Victoria was about 400 acres.

Australia's Present Opportunity.

At this time the whole position with regard to the cultivation of fibre plants underwent a radical alteration. Prior to the war Russia produced more than 80 per cent. of the world's fibre, and owing to the extreme cheapness of labour in that country she was able to place fibre on the market at a comparatively low cost, with the result that the price of fibre in Australia was approximately from £40 to £50 per ton. With the passing of the flax-growing districts of Russia into German hands and the disorganization of the flax industry in France and Belgium, the shortage of fibre for civil and military needs became more and more acute, and prices rose over three times their pre-war level.

With the object primarily of assisting Great Britain to overcome this shortage, the Commonwealth Government guaranteed £5 per ton for standard flax grown during 1918, and under this guarantee the area sown to flax was increased to 1,400 acres. The guarantee for the 1919 crop was increased to £6 per ton, and the area sown that year was

2,200 acres. The treatment of the 1918 crop at the mills is now nearly completed, and an interim dividend of £2 per ton will be distributed this month (April, 1920) to growers, in addition to the £5 already received. Further dividends will be made available on realization of the whole harvest.

The cessation of hostilities has not relieved the shortage of fibre, but rather accentuated it. Stocks of linen throughout the world have been depleted, and there are no reserves of raw material upon which to draw. The opinion is strongly held in English trade circles that remunerative prices will rule for many years, and it is considered most unlikely that prices will ever reach their pre-war level.

In order to encourage farmers to take advantage of this unprecedented opportunity of firmly establishing the flax industry, the Commonwealth Government has guaranteed a price for the flax grown during the next three years. With a three years' guarantee of remunerative prices there is every incentive to farmers in suitable districts, to not only grow flax, but to co-operate in the erection of flax mills for the treatment of the flax straw. The guarantee for 1920 is £6 per ton, and for 1921 and 1922 £5 per ton for raw flax.

Australia imports annually flax products to the value of £1,800,000, and as it has been demonstrated that flax can be grown to perfection in many parts of our continent, any neglect to take full advantage of the present favorable opportunity to develop the industry would be a serious reflection on Australian initiative and enterprise.

Flax for Fibre.

Flax (*Linum usitatissimum*) is to-day one of the most important "dual purpose" crops. The fibre obtained from the straw has a wide range of usefulness, supplying the raw material from which the finest linen, as well as the strongest cordage, can be manufactured; while the seed, known as linseed, is one of the most concentrated and fattening of stock foods. Even after the extraction of the oil, the residue, linseed meal, is a very valuable cattle food. Linseed oil has many uses, and is the chief ingredient of paint.

Flax may be grown either for fibre or seed, and the climatic requirements and cultural operations vary somewhat with the purpose for which the crop is grown. As most flax grown in Victoria is used primarily for the production of fibre, this side of the industry may be dealt with first.

Climate.

For the production of fine long fibre of even quality, the plant requires a rather slow development with few, if any, sudden checks. Success in the raising of such plants could be looked for in districts with a rainfall of upwards of 26 inches, where the spring is cool and moist.

Soils.

Flax is a hardy plant, and provided the land is well drained it will thrive on a variety of soils, but it prefers a free loamy or chocolate soil with a clay subsoil. Good potato land is admirably suited for it, and, generally speaking, satisfactory returns will be obtained from flax when grown under conditions that would produce a good crop of oaten hay.

Among the districts that appear well suited in both soil and climate for the growth of flax are: Central Gippsland, particularly in the vicinity of Drouin, Warragul, Traralgon, and Morwell; Sale, Koo-wee-rup, Lancefield, Romsey, Kyneton, Ballarat, Colac.

Cultural Requirements.

The cultivation does not present any special difficulties. The method is very similar to that required for an oaten hay crop, and the cost of production is very little more. The preparation of the seed bed is most important.

1. The working of the land should be such as will produce a fine tilth and leave the surface as level as possible so as to facilitate cutting close to the ground with the binder and thus reduce the loss of length to a minimum. As good length is one of the most important requirements for flax for fibre the necessity for this precaution is apparent.

2. The land should be clean and free as possible from weeds, especially strongly-growing ones such as wild turnip, dock, thistles, &c. Flax, being a fine stemmed slow-growing plant, is ill-adapted to compete with weeds, especially in its early stages. Should weeds appear after the flax is beginning to grow, they should be cut or pulled out, as there is no crop in which they are more pernicious, for not only do they reduce the yield, but they cause loss and inconvenience in the subsequent treatment at the mills.

Seeding.

Victorian experience has definitely proved that the best time for sowing is from the middle of April to the middle of May, though this may be varied somewhat according to locality and situation; but early seeding is strongly urged for all districts, the object being to have the plants firmly established before the winter sets in. In some districts sowing is prolonged as late as the latter part of June, but unless the spring is exceptionally favorable, there is a danger of such crops being very short, and the comparatively few instances of flax crop failures in the 1918 and 1919 seasons were practically all directly due to the lateness of sowing.

For fibre, seed is sown at the rate of 60 to 70 lbs. to the acre, and may be either drilled in or broadcasted (preferably the latter), and then lightly harrowed and rolled. A broadcast effect may be obtained with a drill by taking out the seed tubes and allowing the seed to dribble on a board set at a slight angle. As the seed is large enough to sow separately there is no necessity to mix it with the fertilizer. If the seed be drilled in, it should be sown very shallow—from $\frac{1}{2}$ to $\frac{3}{4}$ inch deep; otherwise it may fail to germinate.

Seed.

The variety of linseed almost exclusively sown in Victoria is "blue flowering Riga," which has been developed in Drouin district from a small consignment imported some years ago. Growers are strongly advised to use only good Victorian acclimatized seed, as the results obtained from the sowing of imported seed have been most disappointing.

In most countries the practice is to grow flax either for fibre or for seed, and not to use the one crop for both purposes, but in Gippsland it has been found possible to obtain both fibre and seed from the same crop. In order to do so, however, it is necessary to cut the crop when the seed is still slightly immature, and it is a moot point whether better results would not be obtained by sowing linseed which had been allowed to fully mature before harvesting.

There is little doubt that the yield from flax, especially of seed, could be greatly increased by systematic selection. Experiments on flax varieties were inaugurated at the Central Research Farm, Werribee, in 1918, and while they are as yet in the preliminary stage it seems very probable that from a special selection a variety particularly suitable for fibre production will be obtained. Promising results have also been obtained with special seed selection, but of course it will be some time before these new varieties will be available for distribution.

The Commonwealth Flax Committee is distributing good, clean Victorian acclimatized linseed at £1 per bushel, and farmers desiring supplies should communicate with the Secretary, 314 Albert-street, East Melbourne.

Manures.

Bonedust or a mixture of bonedust and superphosphate in quantities of from 1 to 2 cwt. has given very satisfactory results when applied to flax crops. The superphosphate seems to be particularly valuable in assisting the crop to establish itself before the winter sets in.

Flax not an Exhausting Crop.

In some quarters there is a traditional aversion to growing flax on the ground that it exhausts the soil; that this is a misconception is proved not only by chemical analysis, but also by the experience of farmers in the Drouin district, where flax has been grown in rotation with other farm crops for upwards of fifteen years without any deteriorating effect on the fertility of the soil. As a matter of fact, analyses made by the Canadian and United States Departments of Agriculture show that an average crop of flax removes less plant food from the soil than does a crop of wheat or oats. It may also be mentioned that one of the heaviest, if not the heaviest, crop of barley in the Sale district last year was grown on land from which over 2 tons of flax to the acre was taken the year previously.

Necessity for Rotation.

While flax is relatively no more exhausting than an ordinary cereal crop it is essential that it should be grown in rotation with other farm crops, owing to the tendency of land on which it is sown continuously to become "flax-sick." This "flax-sickness" has been shown to be due, not to the exhaustion of the soil, but to the presence in the soil of a fungus disease—Flax wilt (*Fusarium lini*) comparable to, but more virulent than, the well-known disease Take-all (*Ophiobolus graminis*), which attacks wheat crops grown continuously on the same land. The fungus of Flax wilt originates in the soil or in infected seed, and attacks plants at all stages of growth causing them to wilt and die as if for want of water. The remedy consists in rotation of crops in which flax will not be sown on same land oftener than once in four years.

Quite apart from the question of disease it is bad farming both in theory and practice to attempt to crop land continuously with flax. The flax plant has a delicate root system which does not penetrate deeply, and must necessarily, therefore, obtain its nutriment from the upper few inches of soil. Hence to avoid exhausting the surface soil, flax should be grown in rotation with crops which have a more vigorous root system, and are able to penetrate more deeply, and draw a portion of their food materials from the subsoil For the same reason care should be taken, in preparing flax stubble for the succeeding crop, to plough deep enough to bring up some of the subsoil in order to replenish the surface soil with available plant food.

While we still lack definite experimental evidence as to which is the most suitable rotation in which flax may be grown, it appears to fit in well with most farm crops.

A rotation frequently practised in the Drouin district is flax, oats, or potatoes, rape (fed off). Feeding off the rape with sheep tends to clean the land and keep it free from weeds. In autumn the rape is ploughed about 7 inches deep, in preparation for the flax crop which succeeds it in the rotation. A second light ploughing is given, and the land is then worked down with the cultivator and harrowed and sown in April. Flax also does particularly well after potatoes, the thorough working and heavy manuring of the potato land undoubtedly having a beneficial effect on the succeeding flax crop.

Harvesting.

When grown for fibre, flax is harvested before the seed has fully matured. In Ireland and other European countries no attempt is made to save the seed, but in Victoria it has been found possible, by cutting the crop in the middle of the period between flowering and final ripening, to save the seed without damaging the quality of the fibre.

The crop is ready to harvest when most of the seed bolls have turned brown, though a few of the lower ones may be more or less green. The stems at this stage are usually of a golden colour with the lower portion of the foliage dropping off.

In Europe flax for fibre is pulled by hand. The reasons given for adopting this laborious method are (1) to obtain the full length of straw; (2) to avoid stain and injury which may occur from soil moisture soaking into the cut stems while curing in the stook; (3) to avoid the blunt cut ends of fibre.

The scarcity and high cost of farm labour in Australia renders pulling impracticable, and flax is cut with a reaper and binder like a hay crop. Whatever disadvantages this method may have, as compared with pulling, are more than offset by the diminished cost of harvesting. Moreover, when proper attention has been given to the preparation of the seed bed the surface will be smooth and even, and the crop may be cut very close to the ground, and as the roots contain no fibre the loss will be very small.

Flax is considerably tougher to harvest than oats, and the binder knives, which should be plain, not sickle or serrated, must be in good order. It cuts more easily in bright, clear weather, and many experienced growers consider 10 a.m. quite early enough to commence cutting on any day. The sheaves should be of medium size, and well butted, and tied securely nearer the head than the butt, as the tendency

is for the twine to slip towards the bottom. They should be put in long stooks, not round, and stacked when ready, as unduly long exposure in the paddock is not beneficial. A stacked crop allows larger and more even loads to be carted or trucked.

Cost of Production and Returns.

It will be seen therefore that the cultivation and harvesting of the flax crop is much the same as in the case of an ordinary hay crop except that special care is required to get a clean and fine seed bed.

The cost of production varies somewhat, but the following may be taken as a fair average in the Drouin district:—

1. Ploughing, harrowing, and seeding ..	£1	0 0
2. Seed	1	0 0
3. Fertilizer	0	10 0
4. Cutting crop, twine, stooking ..	0	15 0
5. Carting crop	0	5 0
6. Rent	£1	to £1 5s.
Total ..	£4	10s. to £4 15s.

In Drouin district a yield of 2 tons is not uncommon, but the average is $1\frac{3}{4}$ tons. At £6 per ton this would mean a gross return of to £10 10s. per acre, and a net profit of £5 15s. to £6 per acre, exclusive of any bonus which may be available for distribution, and if present prices are maintained the amount of the bonus would mean a substantial addition. In addition, the flax-grower has the advantage of a guaranteed price which in these days of rapid fluctuations of market prices is an important consideration.

Necessity for Mills.

To firmly establish flax growing in any suitable district it is necessary that a mill be within reasonable distance so that the grower's returns will not be diminished by heavy freight charges. In Victoria individual growers formerly attempted to treat their own flax, but this is not economical, and is likely to be unsuccessful for two reasons—

(1) The cost of machinery and equipment for a mill would be a heavy burden for any one farmer.

(2) The flax-grower rarely understands sufficient of the technique of retting and scutching to turn out a thoroughly satisfactory product.

The production of high-grade fibre is essential for the success of a mill, and necessitates long experience and technical skill. It is, therefore, better for the farmer to concentrate on the growing of the flax, work for which with experience he will become specially fitted, and to have it treated at a co-operative mill in charge of a competent manager.

By the establishment of co-operative mills the farmers will add to their returns as growers the profit obtained from the milling operations, and there will be every incentive for them to produce the very best quality crops.

Farmers happily are beginning to realize the advantages of co-operation, and the establishment of flax mills seems to be a suitable and profitable investment for co-operative enterprise.

Already two co-operative mills have been established, one at Dalmore and one at Buln Buln. The Commonwealth Government, through the Commonwealth Flax Committee, is willing to advance money at a low

rate of interest to farmers anxious to establish mills, and under the Agricultural Industries Act the State Government is also empowered to do so, and it is hoped that farmers in suitable districts will take advantage of these opportunities to enter on a progressive policy. In addition to the co-operative mills mentioned, there are also flax mills in operation at Drouin, Longwarry South, and Sale. Ordinarily the growing of 300 to 350 acres in any one locality would warrant the erection of a mill, the cost of which need not exceed £700.

Mill Operations.

The processes to which flax is subjected at the mill are threshing, retting, breaking, and scutching.

Threshing.

The first operation after flax is harvested and cured is to remove the seed. As the straw has to be utilized for the production of fibre it is essential that it should not be damaged during the threshing. To ensure this, the practice is to pass the head of the sheaf between two rollers which revolve in opposite directions and are kept pressed together by means of a spring. The mixture of seed and chaff thus obtained is conveyed by means of an endless belt to a winnower where it is cleaned.

Retting.

The retting of flax consists of treatment which will dissolve the gummy material binding the fibre to the woody stem, so that the separation may be effected with the minimum breakage and loss of fibre.

There are two methods of retting known respectively as water-retting and dew-retting.

In the Courtrai district of Belgium, where the finest fibre in the world is produced, flax is retted in the River Lys, and the great success achieved there is probably largely due to the slow movement and peculiarly suitable quality of the water of that stream.

In Ireland what is known as pit-retting is largely practised. For this method dams or ponds of varying length and about 9 feet wide and 4 feet deep are used, and the bundles of flax are packed in almost vertically with the top or crop end up. Mud or sods are then placed on top, and the whole kept down by stones, so that the sheaves are covered by about 3 inches of water. As fermentation proceeds the sheaves tend to rise, and more stones must be put on to keep them down.

The flax should not be packed so tightly as to prevent the free circulation of water, nor should it be too heavily weighed down. After the first week it is tested every day to see if it is properly retted, and when the retting is completed the flax is removed from the pit and spread out to dry.

In Australia the method of retting used is dew-retting, which is also largely practised in Russia. It consists in spreading the threshed flax straw in long rows a few inches apart on a grass or stubble paddock. Dew-retting is really a fermentation in which bacteria, dew, rain, and sunshine all play a part. The length of time the straw is left out varies according to the weather, but is usually about five or six weeks. To insure even retting the flax is turned at least once during this period. When sufficiently retted the straw is picked up, tied in bundles, and if

not quite dry enough stood in stooks, and then stacked until ready for the breaker.

Retting is one of the most important processes to which flax is subjected, and the success of a scutch mill depends largely upon this operation being carried out correctly. If the straw be under-retted the work of scutching is made more difficult and expensive, while if it be over-retted the fibre produced will be lacking in strength.

Up to the present dew-retting has been the only method used in Australia, but a great deal of interest is being displayed in water-retting, and it is intended to make tests on a large scale at the Sale mill this year. While dew-retting has the advantages of cheapness and simplicity, it does not produce quite as good a quality fibre as water-retting, and has the serious disadvantage of being totally dependent on climatic conditions. By the introduction of water-retting it is considered that not only will the quality of the fibre be improved, but also that the quantity of fibre obtained from each ton of straw will be increased.

However, before the introduction of water-retting could be definitely recommended complete information is required on certain points—

(1) The water used for retting should be soft and free from iron, otherwise the quality of the fibre will be affected, and owing to the high mineral content of the water of many Australian rivers there may be some difficulty in obtaining suitable water;

(2) More labour is required for water-retting, and as it is of rather an unpleasant nature, the question arises as to whether the extra cost under Australian conditions would be compensated for by the increased value of the fibre produced.

These problems can only be solved by carefully conducted tests, and it is hoped that the results of the experiments conducted this year will yield definite information.

In view of the primitive methods of retting obtaining in all flax growing countries, many attempts have been made to perform the work by chemical processes, but up to the present the results have not been sufficiently satisfactory to justify departure from existing methods.

Breaking.

The process of breaking reduces the woody portion to short small pieces, called shives, and facilitates its removal by the scutchers, while the fibre which is tough and elastic is uninjured. The breaker consists of pairs of horizontally-placed, fluted or corrugated rollers, the upper ones being pressed against the lower ones by means of springs. The dry, retted straw is fed end-wise in a thin even layer between the fluted rollers and allowed to pass between them to the other end.

Scutching.

From the breaker the straw is passed to the scutcher where the shives are removed by the action of beaters which revolve at the rate of about 300 revolutions per minute. The fibre left in clean lengths is then baled and pressed, and is ready for the manufacturer.

Future Extension of the Industry.

At the present time, owing to the absence of any machinery for manufacturing canvas duck or linen fabrics, the whole of the flax fibre produced in Australia is exported to Great Britain, but the logical sequence to placing the industry on a firm basis will be the establishment of spinning and weaving mills.

War-time experience has shown us the extreme undesirability of being dependent on outside sources for the supply of such essential military requirements as canvas, tarpaulins, and aeroplane cloth, and the establishment of mills for the manufacture of these goods may be regarded as necessary, if only from the stand-point of military preparedness.

Even before the war a Melbourne firm had under consideration the adding of the manufacture of canvas to its other lines of business, and was only prevented from doing so by the uncertainty of obtaining sufficient local supplies of raw material. It is estimated that the annual minimum requirements of a spinning plant would be 1,000 tons of fibre, which would necessitate the cultivation of approximately 12,000 acres annually.

While this is greatly in excess of the present area, there is no reason why the increased acreage should not be sown, in view of the enormous areas where flax can be grown to perfection, and the prospect of the continuance of high prices for many years.

It is universally recognised the war has created an unparalleled opportunity for the development of the flax and linen industries, and other countries are taking full advantage of it.

For example, Japan is now producing some of the finest canvas in the world, and it does not reflect credit on our national enterprise that much of our canvas is imported from that country.

Growing Flax for Linseed.

Up to the present flax has been grown in Australia almost exclusively for fibre, and the linseed has been regarded more or less in the nature of a by-product. In other countries, however, flax for seed alone is an important crop. In the United States 2,000,000 acres are grown annually for this purpose, and in Canada, India, and the Argentine the linseed industry has assumed considerable dimensions. Australia imports annually nearly £500,000 worth of linseed, and her production is practically negligible.

The shortage of linseed is hampering not only the production of linseed oil, but indirectly many other industries also. The present high prices, therefore, afford a favorable opportunity of making Australia self-contained in the matter of linseed supplies and of establishing linseed-growing as one of the permanent agricultural industries.

In common with all other Eastern produce, the price of linseed has been affected by the change in the rate of Indian exchange, and it has now advanced to 23s. 6d. per bushel in Melbourne. It is, of course, impossible to say how long these prices will be maintained, but as there is a world-wide shortage it appears most unlikely that the price will fall below 15s. per bushel within the next twelve months. As a yield

of 8 to 10 bushels may be reasonably expected under favorable conditions, linseed growing should prove an attractive proposition to farmers in the more favoured parts of the wheat belt.

Climate.

In contrast to flax for fibre which needs an annual rainfall of at least 26 inches; flax for seed alone may be successfully grown on rainfall of 18 to 20 inches. It is a significant fact that all the great linseed-producing regions of the world have climatic conditions very similar to those of the wheat belt of Victoria, namely, high summer temperatures, limited rainfalls, and occasional droughts.

Soils and Cultivation.

So far as soils and cultural requirements, all that has been said with regard to flax for fibre applies with equal force to flax for seed.

The seed should be sown on clean fallow land which should be brought to a finer tilth than is usual for a wheat crop. Flax for seed is drilled in with an ordinary grain and fertilizer drill at the rate of from 30 to 35 lbs. to the acre. The reason for sowing so thinly is to enable the plants to branch out and produce a heavy crop of seed.

Manure.

While definite experimental evidence is lacking as to the manurial requirements of flax for seed it may be taken that superphosphate at the rate of from 1½ to 2 cwt. per acre will be found most effective in the northern parts of the State, and a mixture of superphosphate and bonedust in the moister southern districts.

Harvesting.

When grown for seed flax is allowed to fully mature, and may be harvested with a stripper or combined harvester. Should the latter be used, the blast must be considerably reduced, otherwise some of the seed will be blown away.

A NOTE ON NEW ZEALAND FLAX.

New Zealand flax, a plant that grows extensively in the country from which it derives its name, is cut for its fibre, which is used for making binder-twine, rough rope, &c. It grows only on waste land, and is not a profitable crop on land that can be used for dairying or other purposes.

The plant is not widely grown in New South Wales, and before undertaking its cultivation a local grower would have to arrange for the expensive machinery necessary for its treatment. The flax cannot be cut until the plants reach the age of three years, and the yield under favorable conditions is from 800 to 1,200 lbs. per acre.—*Agricultural Gazette* of New South Wales, April, 1920.

GOVERNMENT CERTIFICATION OF STALLIONS.

Thirteenth Annual Report, Season 1919-20.

By W. A. N. Robertson, B.V.Sc., Chief Veterinary Officer.

For thirteen years the examination of stallions in this State has been conducted under Departmental regulations, and the submission of stallions has been a voluntary act on the part of owners. This, the thirteenth report on the system, will be the last, for under the Horse Breeding Act now in force, it becomes necessary for all owners of stallions used for stud purposes to register them, and to hold a certificate of registration.

It is undoubted that considerable benefit to the horse-breeding industry has accrued from the system of certification in force during the past thirteen years. Breeders have been able to discriminate between sound and unsound sires, and in the mating of high-class mares full advantage has been taken of this knowledge. Amongst the lower grades, however, the same value has not been given to a certificate, and breeding from unsound and nondescript sires has continued to a greater or less extent. Thus the diminution of unsoundness in horses examined has not been as great as would have been the case had all unsound sires been debarred from service during the period under review.

In all, 8,386 stallions have been examined, and 2,348 have been refused certificates. Of this number, 1,125, or 13.4 per cent., were found unsound; and 1,223, or 14.5 per cent., were below a reasonable standard.

During last season, 10 per cent. were found to be unsound; so it will be seen that the rejections under this head were below the average.

As pointed out in previous reports, a study of the figures relating to draught horse gives the most satisfactory basis upon which to determine the success of the system, for the reason that a greater number of this class is examined, and further, this class is more subject to unsoundness than the lighter breeds.

Perusal of the summary of the thirteen years' work shows that 5,244 draught stallions were examined, and 894, or 17.05 per cent., were rejected as unsound. The highest percentage was during the period 1908-1909, when the number rejected represented 27.3 per cent. The lowest was in 1913-14, when 11 per cent. was refused.

During the first three years of the period the average unsoundness was 24 per cent., whilst for the last three years 13 per cent. only were rejected under this head.

It is obvious, therefore, that there has been a slow dimunition of the amount of unsoundness detected, but it must be remembered that during the first years many aged horses were examined, whilst of late very few aged animals have been submitted to examination, and of the number many had been previously certificated. Consequently, the figures are not an accurate index of the elimination of unsoundness; they are, however, sufficiently striking to indicate the possibilities which it is hoped to achieve under the Act, the provisions of which will be referred to at a later stage.

Examination and Rejections, 1919-20.

Seventy-five parades were held during the past season, and 230 stallions were submitted to the Veterinary Officers for examination. Of the total 23, or 10 per cent., were refused certificates because of the presence of some hereditary unsoundness, and 39, or 16.9 per cent., because they were considered to be below a reasonable standard.

As in previous years sidebone was responsible for the major portion of rejections under the heading of unsoundness, 14, or 6.09 per cent., being rejected on this account. This is a reduction on the figures of the previous year, when 9.54 per cent. was found affected.

Six cases of ringbone were detected. They were distributed amongst each class of horse, two draughts, three lights, and one pony being affected. There is a slight increase in the percentage here, but as the numbers are so low no deduction can be drawn.

A question arises here as to why sidebone has been and is the unsoundness most prevelant. Part at least of the answer may, I think, be found in the fact that sidebone is the least observable of all. It will be immediately conceded that a breeder is very much averse to using a stallion showing any lumps or swellings about the legs. Every horseman knows that the first essential of a good horse is clean, sound legs. Now Ringbone, Bog Spavin, and Curb are readily discernible; therefore the stallion owners in the first place, and the owners of mares in the second place, do not use an animal showing any of these noticeable defects. Thus for generations the horse-owner has been automatically culling such unsoundnesses. With sidebone, however, the swelling is, in most cases, not visible, being hidden by hair, or lost in the natural curves of the part. Hence in horses so affected culling has not been carried out, and the unsoundness has become more common. Other factors, both physiological and pathological, have no doubt operated, and must not be lost sight of.

The result of the examinations during last season are set forth in the accompanying table.

Table Showing Details of Examination.

	Draughts.		Lights.		Ponies.		Total.	
	Examined.	Certificated.	Examined.	Certificated.	Examined.	Certificated.	Examined.	Certificated.
	134	103	70	48	26	17	230	168
	Rejected.	Per cent. Rejected.	Rejected.	Per cent. Rejected.	Rejected.	Per cent. Rejected.	Rejected.	Per cent. Rejected.
Bog Spavin	...	...	...	..	...	...	...	...
Bone Spavin	...	...	2	2·86	...	...	2	·87
Curb ...	...	..	1	1 43	.	..	1	·44
Ringbone ...	2	1 49	3	4 28	1	3·85	6	2·61
Sidebone ...	13	9·70	...	...	1	3·85	14	6·09
Stringhalt ...	...	...	...	...	...	...	...	...
Through unsoundness	15	11·19	6	8·57	2	7 69	23	10·00
Through disapproval	16	11·94	16	22·86	7	26·92	39	16·96
Total rejected	31	23·13	22	31·43	9	34·61	62	26·96

Re-examinations.

Seventy-five stallions previously certificated were re-submitted to examination, and only three were found to have developed unsoundness. This is very pleasing evidence of the value of certification, for it may be taken as an index that the factor for the development of unsoundness is diminishing.

The analysis of these re-examinations is as follows:—

Horses Submitted for Renewal of Certificates.

	3 years.		4 years		5 years.		Totals.	
	Examined.	Certificated.	Examined.	Certificated.	Examined.	Certificated.	Examined.	Certificated.
	6	5	32	28	37	32	75	65
	Rejected.	Per cent. Rejected.	Rejected.	Per cent. Rejected.	Rejected.	Per cent. Rejected.	Rejected.	Per cent. Rejected.
Disapproval	1	16·67	3	9·37	3	8·11	7	9·33
Sidebone ..	..	..	..	..	1	2·71	1	1·33
Ringbone	..	..	1	3·12	..	..	1	1·33
Spavin ..	..	..	..	..	1	2·71	1	1·33
Total ..	1	16·67	4	12·5	5	13·51	10	13·33

The following certificates were presented for transfer to Victoria:—New Zealand, 3; South Australia, 1; and 1 South Australian certificate was indorsed for Victorian Shows.

Examination of Mares.

The practice of examining stud-book mares was continued during the season, and 18 received certificates of soundness. The analysis of this phase of examination is as follows:—

Season 1919-20.

	Stud-Book—Draught Mares.	
	Examined, 23.	Certificated, 18.
	Rejected.	Per cent. rejected.
Sidebone	3	13·04
Ringbone	1	4·35
Stringhalt	1	4·35
Total rejected	5	21·74

The system of the examination of mares will be continued as heretofore.

Appeals.

Only two appeals against the decision of the examining officers were lodged during the year. Both cases were in respect of animals being considered below standard, and in each case the appeal was upheld, and a certificate issued.

Staff.

The work of the individual veterinary officers is set forth in the following table:—

Name of Examiner.	Number Examined.	Number Certificated.	Number Rejected.	Percentage Rejected.
Mr. R. Griffin, M.R.C.V.S.	59	40	19	32·20
Mr. R. N. Johnstone, B.V.Sc. ...	54	43	11	20·37
Mr. W. M. Lerew, G.M.V.C. ...	42	34	8	19·05
Mr. R. Talbot, L.V.Sc	59	38	21	35·59
M. W. D. Shew, G.M.V.C.	14	11	3	21·43
Appeal Boards	2	2	...	...

It will be observed that the staff is returning to normal numbers. Since the completion of examination Col. E. A. Kendall, C.M.G., B.V.Sc., the remaining member, has returned to duty, and will be available for work under the Act next season. I should like to place on record my appreciation of the work of those officers who, during the very strenuous years past, enable the system to be maintained without break, particularly to Messrs. Griffin and Lerew, who, for portion of the time, carried the whole responsibility.

The Horse Breeding Act.

When the Departmental certification of stallions was introduced, it was recognised that the logical outcome of the system would be registration or licensing under a compulsory system, and the complete elimination of the uncertificated horse, which was allowed to compete with the certificated one. As time progressed the need for such action became more and more pronounced, and stallion owners more imbued with the idea of its necessity. This resulted last year in the passage through Parliament of the Horse Breeding Act to give effect to the desire of all who had the welfare of the horse-breeding industry at heart. No more appropriate time could have been selected, for the number of stallions in the State has probably never been so low, and as a demand for more horses is inevitable, breeding may be placed on a more stable footing.

In effect, the Act gives little more than the force of law to the system previously in vogue, with the important difference that the horse which does not in the future receive the certificate of registration will have to be put out of breeding operations in Victoria. From now onward a stallion which is not registered cannot be used for stud purposes by any person; this precludes his use even with mares of his owner. The argument has been advanced that an owner should be allowed to do as

he likes with his own. Whilst this line of thought may be sympathized with, it must not be overlooked that in breeding horses or stock the progeny are sooner or later placed on the market, and thus unsoundness is perpetuated. If unsoundness is to be removed, then an owner has no more right to perpetuate it than he has to breed from a diseased cow. Under the Act stallion-owners are required to make application for registration prior to the 1st July each year, and with the application a fee of £1 must be forwarded. This condition of application will require careful attention of owners, and it must be made annually. Forms of applications will in due course be sent to secretaries of Agricultural Societies and officers in charge of Police Stations, and they must be completed and forwarded prior to examination. In the past owners have submitted stallions to the veterinary officer at parades. In the future, unless applications are received, there will be no guarantee that a veterinary officer will be in attendance, notwithstanding the fact that a parade has been advertised. Further, unless good cause can be shown why an application has not been forwarded, the officer may refuse to make an examination, and throw on the owner the necessity of arranging for a special examination, and paying a special fee therefor. Should a person purchase a stallion which is already registered, the certificate of registration will hold good for 30 days only, unless the change of ownership is indorsed by the Chief Veterinary Inspector.

In the event of the stallion holding a Life Certificate issued by the Department under the Regulations heretofore in force, or being registered under the Act as a five-year-old, the issue of a certificate of registration will be automatic, for such horses are not, save under exceptional circumstances, required to be submitted to examination. Stallions of three, four, or five years of age will, however, require to be examined, and in making application for registration owners should indicate the most convenient centre at which such examination may be conducted.

As it is now compulsory for every stallion to be registered, it becomes necessary to arrange for a much greater number of parades than formerly. As many districts are without the assistance of local Agricultural Societies, arrangements have been made, with the kind consent of Sir George Steward, Chief Commissioner of Police, whereby a notice will be displayed at Police Stations intimating when and where the nearest parade has been arranged. If good and sufficient reason can be given that the distance to any advertised parade is too great, arrangements may be made for additional parades.

Any person using an unregistered stallion for stud purposes is liable to a fine up to £100. This penalty will apply to the owner of the mare served as well as to the owner of the stallion. The owner of a mare may always protect himself by demanding the production of the Certificate of Registration, or a duly certified copy of same (which may be obtained on payment of a fee of £1). The certificate or copy must also be produced, on demand, to any member of the police force or an officer of the Department of Agriculture.

Owners of stallions will require to take particular care of certificates issued, for they must be returned to the Chief Veterinary Inspector on

expiration, and when application is made for fresh certificate. If not returned re-registration may be refused. Further, in the event of the death, castration, or change of ownership, they must be similarly returned. Should a stallion die during the currency of a certificate, the fact that the certificate is not returned may not be immediately noticed, but on the issue of the next register the absence of such stallion will be obvious, and the reason for its omission sought. Any owner who has not then returned the certificate will become liable for a breach of the Act and Regulations.

There are many thoroughbred stallions of high repute in the racing world which could not be granted a certificate of soundness, yet could command a high fee at the stud for racing purposes. Recognising that such animals are doing little harm to the breeder of utility horses, it has been decided to omit them from the provisions of the Act. This concession will hold only so long as they are used on mares which are registered in a prescribed stud-book. As soon as such stallions are withdrawn from racing, and stand for service of farmer's mares, they become subject to the Act. The service of even one mare not registered in a stud-book would be sufficient to remove the exemption from them.

The Regulations under the Horse Breeding Act are given in detail hereunder:—

1. In the Interpretation of these Regulations, unless inconsistent with the context or subject-matter—

"Act" means *Horse Breeding Act* 1919, No. 3040.

"Approved standard" means a standard which conforms to a reasonable standard in respect of type, conformation, and breeding.

"Certificate" means a certificate for the time being in force of registration under this Act.

"Chief Veterinary Inspector" means the Chief Veterinary Inspector of the Department of Agriculture.

"Inspection Parade" means a parade of a stallion or stallions for the purpose of examination under this Act with a view to determining whether or not it or they is or are sound and of approved standard.

"Owner" means any owner (whether jointly or in severalty and whether absolutely or a lessee) or person in possession or charge of a stallion.

"Prescribed" means prescribed by this Act or the regulations.

"Register" means the register of stallions kept in pursuance of this Act.

"Registered" means entered pursuant to this Act in the register.

"Registration" means registration for the time being in force under this Act.

"Regulations" means regulations made under this Act.

"Sound" means free from such diseases or defects as are deemed by the regulations to constitute hereditary unsoundness, and "soundness" has a corresponding meaning.

"Special inspection parade" means an inspection parade held at the request of the owner of the stallion.

"Stallion" means any male horse or donkey not wholly castrated and over the age of two years.

"Stud purposes" means mating with females for the purpose of procreation.

"Thoroughbred mare" and "thoroughbred stallion" means respectively a mare or a stallion entered in any prescribed stud-book or in the register kept by the association known as the Victorian Trotting and Racing Association.

"Veterinary officer" means a veterinary surgeon in the employment of the Department of Agriculture.

2. Every owner of other than a registered thoroughbred stallion which is used for stud purposes with registered thoroughbred mares only shall on or before the first day of July in each year apply in writing to the Chief Veterinary Inspector to have such stallion registered, and with each such application shall forward a fee of Twenty shillings. The application shall be in the following form:—

APPLICATION FOR REGISTRATION OF A STALLION.

(*Horse Breeding Act* 1919.)

The Chief Veterinary Inspector,
Department of Agriculture,
Melbourne.

I (1) hereby apply for registration of my (2) stallion (3) for the period ending 30th June (4) 19 , and I enclose herewith the sum of One pound (£1), being the amount of the prescribed fee. I submit the following true particulars of the above-named stallion.

Date foaled

Sire { Sire's sire / Sire's dam

Dam { Dam's sire / Dam's dam

Signature
Postal address

Date

(1) Name of applicant. (2) Class of stallion—draught, light, pony, thoroughbred. (3) Name of stallion. (4) If application is made after 31st March and before 1st July the "period" is to the 30th June in the following year.

3. Every owner shall submit his stallion or stallions to examination by a veterinary officer at an inspection parade arranged by the Chief Veterinary Inspector, excepting any stallion being five years of age or over registered under the Act or in respect of which a "Life" Certificate has been issued by the Department of Agriculture of Victoria.

4. Secretaries of agriculture societies or similar bodies shall make all necessary arrangements for inspection parades as required by the Chief Veterinary Inspector or by the veterinary officer conducting the examination. Where no such society exists a local police officer will notify owners who inquire of the arrangements made.

5. An owner who is or has been unable to submit his stallion for examination at an inspection parade may apply to the Chief Veterinary Inspector for a special inspection parade, and if the Chief Veterinary Inspector deem the reasons good and sufficient a parade may be arranged on the owner making payment, in advance, of the prescribed fee.

6. The fee for a special inspection parade shall be One pound (£1), together with the amount of railway fare (first class) from Melbourne to the place of examination and return.

7. (*a*) The hereditary unsoundnesses, the presence of any of which will constitute a reason for the refusal of a certificate of registration, are as follow:—

Bog spavin.	Ringbone.
Bone spavin.	Roaring.
Cataract.	Sidebone.
Chorea "shivering" or "nervy."	Stringhalt.
Curb.	Thoroughpin.
Navicular disease.	Whistling.
Nasal disease (Osteo-porosis).	

(*b*) A certificate will also be refused in the case of an animal considered by the examining veterinary officer to be below a reasonable standard as regards type, conformation, and breeding.

(*c*) For the purpose of these regulations "ringbone," "sidebone," and "curb" are defined as follows:—

i. "Ringbone."—Any exostosis on the anterior or lateral aspect of the phalanges below the upper third of the Os Suffraginis shall constitute a ringbone.

ii. "Sidebone."—Any ossification of the lateral cartilage shall constitute a sidebone.

iii. "Curb."—Any circumscribed swelling on the posterior aspect of the hock in the median line and within the lower third of the limits of the hock and the head of the metatarsal bones shall constitute a curb.

8. An owner shall furnish the examining veterinary officer with such particulars concerning a stallion as the officer may require at the time of examination of such stallion (such as name, breeder, pedigree, age, prior ownership, &c.), and if the veterinary officer deems it necessary the owner shall furnish a Statutory Declaration in regard to such particulars.

9. The Chief Veterinary Inspector shall, in writing, notify the owner of any stallion in respect of which a certificate is refused within fourteen days of such refusal, and shall state in such notification the reason for refusal.

10. Until the issue of a certificate or the publication of the Register the result of an examination of a stallion by a veterinary officer shall not be communicated to any person except as herein provided or under circumstances as follow:—

The veterinary officer may, in his discretion, communicate to an owner or an owner's agent duly authorized in writing to inquire the result of examination of such owner's stallion or stallions.

The reason for refusal of a certificate shall not be communicated to any person except the owner concerned or his agent duly authorized in writing, save under the direction of the Court in legal proceedings.

11. The certificate of registration shall be in the following form:—

Victoria.

Horse Breeding Act 1919.

CERTIFICATE OF REGISTRATION.

Issued in respect of the (1) stallion (2) owned by (3) of (4) the above-named stallion, which was submitted to veterinary examination at (5) on (6) and declared free from hereditary unsoundness, may be used for stud purposes until the 30th June, 19 .

Chief Veterinary Inspector.

Department of Agriculture,
Melbourne,

(1) Class. (2) Name, age and description. (3) Owner's name. (4) Owner's address. (5) Place of examination. (6) Date of examination.

12. The certificate of registration shall remain in force until the 30th day of June next following the date of issue. Provided that a certificate issued in respect of a registration made not more than three months before the 30th day of June in any year shall remain in force until the 30th day of June in that year and for twelve months thereafter.

13. An owner shall forthwith, in writing, notify the Chief Veterinary Inspector of the death or castration of his stallion, and shall with such notice return the certificate issued in respect of such stallion.

14. An owner shall forthwith, in writing, notify the Chief Veterinary Inspector of the sale or change in ownership of his stallion, and shall with such notice

forward the certificate issued in respect of the stallion concerned, together with the name and address of the person to whom ownership is transferred. The Chief Veterinary Inspector shall thereupon indorse on the certificate the transfer of ownership and forward it to the person who has become the owner, and unless in such circumstances a certificate is so indorsed within one month after change of ownership the registration and the certificate shall be deemed to be cancelled.

15. An owner may, on payment of a fee of Twenty shillings, obtain a copy of the certificate of registration of his stallion, which copy, if indorsed as such by the Chief Veterinary Inspector, shall be deemed a certified copy.

16. An owner or person in charge of a registered stallion shall, on demand by

(*a*) the owner or person in charge of a mare to be served; or by

(*b*) a veterinary officer in the employment of the Department of Agriculture, or any officer authorized, in writing, by the Minister; or by

(*c*) a member of the Police Force,

produce the certificate of registration issued in respect of his stallion or the certified copy thereof for perusal.

17. (*a*) If the report of a veterinary officer shows that a stallion is not sound or is not of approved standard, the owner may apply, in writing, to the Chief Veterinary Inspector to have the stallion examined by an Appeal Board.

(*b*) If the report of the veterinary officer shows that the stallion is not sound the application for examination by an Appeal Board shall be accompanied by a certificate from a registered veterinary surgeon that the stallion has been found by him on examination subsequent to the veterinary officer's examination to be free from the hereditary unsoundness prescribed under these regulations.

(*c*) If the report of the veterinary officer shows that the stallion is not of approved standard the application for examination by an Appeal Board shall be accompanied by a certificate from the president and two members of the committee of the society which arranged the inspection parade at which the stallion was examined that in their opinion the stallion is of a standard which conforms to a reasonable standard in respect of type, conformation, and breeding, provided that if no such society were concerned in the examination a similar certificate from three equine judges of repute will be accepted.

18. Each application for examination by an Appeal Board shall be accompanied by a fee of Four pounds, together with the owner's undertaking, in writing, to pay such sum for or towards the cost and expenses of the examination as is fixed by the Minister.

If the Minister does not confirm the report of the veterinary officer to which the applicant relates the fee shall be returned to the applicant, and no sum for or towards the cost and expenses of the Appeal Board's examination shall be payable by the applicant.

19. An Appeal Board shall consist of the Chief Veterinary Officer and

(*a*) where the veterinary officer's report shows that the stallion is not sound such two members (being veterinary surgeons) of the panel of referees

(*b*) where the veterinary officer's report shows that the stallion is not of approved standard such two members of the panel of referees

as in either of such cases are selected by the Minister.

20. The stud-books prescribed for the purpose of the Act are the *Australian Stud-Book* and the Register kept by the Victorian Trotting and Racing Association.

SUMMARY OF THIRTEEN YEARS' WORK, 1907-1919.

Season.	DRAUGHTS.				LIGHTS.				PONIES.				TOTALS.			
	Examined.	Certificated.	Rejected.	Percentage.	Examined.	Certificated.	Rejected.	Percentage.	Examined.	Certificated.	Rejected.	Percentage.	Examined.	Certificated.	Rejected.	Percentage.
1907-8 ..	403	271	(Unsound) 96 (Disapproved) 36 132	23·82 8·93 32·75	301	246	(Unsound) .. 32 (Disapproved) 23 55	10·63 7·64 18·27	214	186	(Unsound) .. 10 (Disapproved) 18 28	4·67 8·41 13·08	918	703	(Unsound) .. 138 (Disapproved) 77 215	15·04 8·38 23·42
1908-9 ..	501	341	(Unsound) .. 137 (Disapproved) 23 160	27·33 4·59 31·92	295	242	(Unsound) .. 29 (Disapproved) 24 53	9·83 8·13 17·96	199	159	(Unsound) .. 5 (Disapproved) 35 40	2·5 17·58 20·10	995	742	(Unsound) .. 171 (Disapproved) 82 253	17·17 8·24 25·41
1909-10 ..	410	275	(Unsound) 96 (Disapproved) 39 135	23·52 9·56 33·08	191	147	(Unsound) .. 12 (Disapproved) 32 44	6·27 16·77 23·04	156	112	(Unsound) .. 5 (Disapproved) 39 44	3·29 25·65 28·94	757	534	(Unsound) .. 113 (Disapproved) 110 223	15·04 14·65 29·69
1910-11 ..	542	387	(Unsound) .. 117 (Disapproved) 38 155	21·57 7·01 28·58	143	108	(Unsound) .. 15 (Disapproved) 20 35	10·53 14·08 24·61	128	101	(Unsound) .. 7 (Disapproved) 20 27	5·47 15·62 21·09	813	596	(Unsound) .. 139 (Disapproved) 78 217	17·09 9·6 26·69
1911-12 ..	692	554	(Unsound) .. 84 (Disapproved) 54 138	12·13 7·8 19·94	165	121	(Unsound) .. 13 (Disapproved) 31 44	7·87 18·78 26·66	122	83	(Unsound) .. 5 (Disapproved) 34 39	4·09 27·86 31·96	979	758	(Unsound) .. 102 (Disapproved) 119 221	10·42 12·15 22·57
1912-13 ..	745	597	(Unsound) .. 89 (Disapproved) 59 148	12·03 7·92 19·73	139	106	(Unsound) .. 19 (Disapproved) 14 33	13·67 10·07 23·74	70	43	(Unsound) .. 2 (Disapproved) 25 27	2·85 35·71 38·57	954	746	(Unsound) .. 110 (Disapproved) 98 208	11·59 10·27 21·81
1913-14 ..	718	507	(Unsound) .. 79 (Disapproved) 132 211	11·0 18·38 29·39	157	102	(Unsound) .. 16 (Disapproved) 39 55	10·19 24·84 35·03	88	60	(Unsound) .. 5 (Disapproved) 23 28	5·68 26·14 31·82	963	669	(Unsound) .. 100 (Disapproved) 194 294	10·38 20·14 30·53

Summary of Thirteen Years' Work. 1907–1919—*continued.*

Season.	Draughts.				Lights.				Ponies.				Totals.			
	Examined.	Certificated.	Rejected.	Percentage.	Examined.	Certificated.	Rejected.	Percentage.	Examined.	Certificated.	Rejected.	Percentage.	Examined.	Certificated.	Rejected.	Percentage.
1914–15 ..	400	267	(Unsound) .. 62 (Disapproved) 71 133	15·50 17·75 33·25	121	75	(Unsound) .. 14 (Disapproved) 32 46	11·57 26·44 38·01	82	55	(Unsound) .. 7 (Disapproved) 20 27	8·53 24·39 32·92	603	397	(Unsound) .. 83 (Disapproved) 123 206	13·76 20·40 34·16
1915–16 ..	239	144	(Unsound) .. 47 (Disapproved) 48 95	19·67 20·08 39·75	71	48	(Unsound) .. 5 (Disapproved) 18 23	7·04 25·35 32·39	45	28	(Unsound) .. 1 (Disapproved) 16 17	2·22 35·55 37·77	355	220	(Unsound) .. 53 (Disapproved) 82 135	14·93 23·10 38·03
1916–17 ..	188	116	(Unsound) .. 31 (Disapproved) 41 72	16·49 21·81 38·30	79	40	(Unsound) .. 3 (Disapproved) 36 39	3·80 45·57 49·37	53	29	(Unsound) .. 2 (Disapproved) 22 24	3·77 41·51 45·28	320	185	(Unsound) .. 36 (Disapproved) 99 135	11·25 30·94 42·19
1917–18 ..	121	82	(Unsound) .. 14 (Disapproved) 25 39	11·57 20·66 32·23	84	52	(Unsound) .. 3 (Disapproved) 29 32	3·57 34·52 38·09	32	20	(Unsound) .. 2 (Disapproved) 10 12	6·25 31·25 37·50	237	154	(Unsound) .. 19 (Disapproved) 64 83	8·02 27·00 35·02
1918–19 ..	151	97	(Unsound) .. 27 (Disapproved) 27 54	17·88 17·88 35·76	75	44	(Unsound) .. 11 (Disapproved) 20 31	14·66 26·67 41·33	36	25	(Unsound) .. 0 (Disapproved) 11 11	.. 30·55 30·55	262	166	(Unsound) .. 38 (Disapproved) 58 96	14·50 22·14 36·64
1919–20 ..	134	103	(Unsound) .. 15 (Disapproved) 16 31	11·19 11·19 23·13	70	48	(Unsound) .. 6 (Disapproved) 16 22	8·57 22·86 31·43	26	17	(Unsound) .. 2 (Disapproved) 7 9	7·69 26·92 34·61	230	168	(Unsound) .. 23 (Disapproved) 39 62	10·00 16·96 26·96
			(Unsound) .. 894 (Disapproved) 609	17·05 11·61			(Unsound) .. 178 (Disapproved) 334	9·41 17·66			(Unsound) .. 53 (Disapproved) 280	4·24 22·38			(Unsound) .. 1,125 (Disapproved) 1,223	13·41 14·58
Grand Total	5244	3741	1,503	28·66	1891	1379	512	27·07	1251	918	333	26·62	8386	6038	2,348	28·00

SUPPLEMENTARY LIST OF LIFE CERTIFICATED STALLIONS.

Cert. No.	Name of Horse.	Age.	Owner.	Parade.	Date of Examination.	Officer
			DRAUGHTS.			
3208	Baron Juno	5 years	W. T. Manifold	Camperdown	2.9.19	R.T.
3176	Baron Leigh	5 years	Mur Khan	Royal Show Grounds	21.7.19	R.N.J.
3211	Baron Minto	5 years	W. Hermiston	Mansfield	5.9.19	R.T.
3214	Baron Wigton	Aged	Department of Agriculture	Werribee Special	9.9.19	R.G.
3216	Beacon	5 years	R. Stockdale	Warragul	11.9.19	R.G.
3181	Bold Agitation	5 years	W. Cumming	Benalla	1.8.19	W.M.L.
3177	Bold MacGregor	6 years	T. Cantwell	Walpeup	30.7.19	R.G.
3182	Bonnie Brae	5 years	King Bros.	Birchip	30.7.19	R.N.J.
3194	Brestknot	5 years	W. J. Moll	Dimboola	15.8.19	R.T.
3188	Bute Laddie	5 years	Crawford Bros.	Tatura	13.8.19	W.M.L.
3197	Commander	6 years	A. Simon	Tallangatta	18.8.19	R.T.
3186	Ian McClelland	5 years	H. Naylor	Beulah	7.8.19	R.N.J.
3226	Kilmore	5 years	J. Ivill	Orbost	30.10.19	W.D.S.
3205	Kitchener	5 years	Dookie Agricultural College	Dookie	25.8.19	R.T.
3169	Knight of the Garter	Aged	A. and A. Kennedy	Royal Show Grounds	21.7.19	R.N.J.
3225	Lord Valcourt	Aged	J. H. Roulston	Coleraine	11.9.19	Appeal Board
3183	Marshal Clyde	5 years	J. Nunn	Birchip	30.7.19	R.N.J.
3163	Nailstone Fancy	5 years	J. Manning	Horsham	9.7.19	R.N.J.
3219	Oak Burn	Aged	C. A. Roberts	Inglewood	16.9.19	R.G.
3165	Ranfurly	8 years	C. Colyer	Goroke	8.7.19	R.N.J.
3171	Royal Charm	5 years	A. J. Thompson	Royal Show Grounds	21.7.19	R.N.J.
3199	Royal Prince	Aged	W. J. Butcher	Sea Lake	22.8.19	R.N.J.
3190	Royal Success	5 years	F. Kossatz	Nhill	13.8.19	R.G.
3175	Scotland's Sport	Aged	W. Schultz	New Zealand Examination	25.4.19	..
3172	Scottie	5 years	Collis and Nolan	Royal Show Grounds	21.7.19	R.N.J.
3203	Sir Onward	5 years	A. Danson	Numurkah	27.8.19	R.T.
3173	Standard Bearer	5 years	J. Petrie, jun.	Royal Show Grounds	21.7.19	R.N.J.
3185	Sterling Prince	Aged	Cumming and Murphy	Kerang	6.8.19	W.M.L.
3178	The Link	5 years	A. O. Symes	Walpeup	30.7.19	R.G.
3164	Wigton Again	5 years	A. and J. H. Young	Horsham	9.7.19	R.G.
3201	Young Nailstone	6 years	Schroeder Bros.	Murrayville	26.8.19	R.G.
3180	Young Middlemarch	5 years	P. J. O'Donohue	St. Arnaud	31.7.19	W.D.S.
			THOROUGHBREDS.			
3184	Corridella	5 years	W. O'Loughlin	Hopetoun	5.8.19	R.N.J.
3162	Headwind	Aged	Moonee Valley Racing Club	Newmarket Special	28.3.19	R.N.J.
3212	Orinoco	Aged	G. Ritchie and Sons	Mansfield	5.9.19	R.T.
3210	Petrilott	Aged	W. O. King	Ararat	3.9.19	R.N.J.
3187	Phylactery	Aged	T. Gash	Pyramid	7.8.19	W.M.L.
3218	Snow Shoes	Aged	H. Wiseman	Sunbury	10.9.19	R.T.
			LIGHT HORSES.			
3191	All Black	5 years	J. Marks	Elmore	14.8.19	W.M.L.
3195	Angle Jack	Aged	C. F. Hillas	Tallangatta	18.8.19	R.T.
3179	Battarlons	6 years	T. Skelly	St. Arnaud	30.7.19	W.D.S.
3166	Ben Marcelene	6 years	A. T. Cox	Public Offices	14.7.19	W.M.L.
3204	Best Vale	5 years	D. Chilcote	Dookie	25.8.19	R.T.
3196	Bogandyera	5 years	J. Hargreaves	Tallangatta	18.8.19	R.T.
3198	Gratton's Voyage	5 years	Busst and Glasheen	Bendigo Special	18.8.19	R.N.J.
3192	Hold Up	5 years	A. B. Burns	Rainbow	14.8.19	R.G.
3202	Jack	5 years	I. Tyers	Numurkah	27.8.19	R.T.
3221	Limestone	Aged	E. Miller	Royal Show Grounds	20.9.19	W.M.L.
3213	Mountain Palm	Aged	E. J. Lukey	Public Offices	6.9.19	R.T.
3193	Moving Picture	Aged	W. Fisher	Rainbow	14.8.19	R.T.
3222	Osiris	5 years	C. Knipe	Royal Show	22.9.19	R.N.J.
3170	Prince Mauritius	Aged	Collis and Nolan	Royal Show Grounds	22.7.19	W.M.L.
3206	Wallac	Aged	L. Nash	Dookie	25.8.19	R.T.
3190	Young Shifter	5 years	A. Linke	Jeparit	14.8.19	R.T.

SUPPLEMENTARY LIST OF LIFE CERTIFICATED STALLIONS—*continued.*

Cert. No.	Name of Horse.	Age.	Owner.	Parade.	Date of Examination.	Officer.
			PONIES.			
3200	Abdulla King ..	5 years	T. Stevens ..	Euroa	22.8.19	R.T.
3220	Hermes of Shetland Heights	6 years	Mrs. J. Maclellan ..	Royal Show ..	20.9.19	W.D.S.
3167	Little Lonsdale ..	6 years	J. Mahoney ..	Coleraine ..	15.7.19	R.G.
3207	Lord Bally ..	5 years	G. Smith ..	Colac	1.9.19	R.T.
3217	Sun Star ..	5 years	J. T. Unwin ..	Warragul ..	11.9.19	R.G.
3174	Young Cymo Bach	5 years	A. B. Anderson ..	Royal Show Grounds	21.7.19	R.N.J.
3209	Young Recruit ..	5 years	A. E. Osborne ..	Camperdown ..	2.9.19	R.T.

STALLION PARADES.

TIME TABLE, 1920.

Provided the applications for registration indicate that there will be a horse in attendance for examination, a parade will be held at each of the following places :—

At Centres where a Veterinary Officer remains overnight a lecture may be arranged.

Date.	Place.	Time.	Officer Arrives.	Officer Departs.
Every Saturday between 26th June and 18th December	Agricultural Offices	10 a.m. to 12 noon		
Tuesday, July 6 ..	Natimuk ..	11 a.m. ..	7 p.m. (5th) ..	12.15 p.m.
Tuesday, July 6 ..	Goroke ..	3 p.m. ..	2 p.m. ..	6 p.m.
Wednesday, July 7 ..	Horsham ..	9 a.m. ..	9.25 p.m. (6th)	2.59 a.m. (8th)
Thursday, July 8 ..	Stawell ..	11 a.m. ..	4.32 a.m. ..	2.48 p.m.
Thursday, July 8	Rupanyup	4.40 p.m.	4.40 p.m. ..	9.45 a.m. (9th)
Tuesday, July 13 ..	Balmoral ..	11 a.m. ..	10.25 p.m. (12th)	12.30 p.m. (driving)
Tuesday, July 13 ..	Toolondo ..	4.30 p.m.	4.30 p.m. ..	8 a.m. (14th)
Tuesday, July 13 ..	Coleraine ..	11 a.m. ..	7.35 p.m. (12th)	Driving
Tuesday, July 13 ..	Casterton ..	3 p.m. ..	Driving ..	6.15 a.m. (14th)
Thursday, July 15 ..	Edenhope ..	11 a.m. ..	4.45 p.m. (14th)	4.30 a.m. (16th)
Tuesday, July 13 ..	Dartmoor ..	11 a.m. ..	10.15 p.m. (12th)	9.55 a.m. (14th)
Wednesday, July 14..	Heywood ..	11.45 a.m.	11.45 a.m.. ..	12.20 p.m.
Wednesday, July 14	Portland ..	1.30 p.m.	1.5 p.m. ..	2.55 p.m.
Thursday, July 15 ..	Branxholme	10 a.m. ..	5.25 p.m. (14th)	11.20 a.m.
Thursday, July 15 ..	Hamilton ..	2 p.m. ..	12 noon ..	6.35 p.m.
Friday, July 16 ..	Penshurst ..	9.30 a.m.	7.30 p.m. (15th)	10.16 a.m.

STALLION PARADES. TIME TABLE—*continued.*

Date.	Place.	Time	Officer Arrives.	Officer Departs
July 16 ..	Melbourne ..	2.30 p.m.		
July 19 and 20 ..	Royal Show Grounds	10 a.m		
Tuesday, July 27 ..	Murrayville	3 p.m. ..	2.30 p.m. ..	4.30 a.m. (28th)
Wednesday, July 28..	Ouyen ..	11 a.m. ..	10 a.m. ..	3.6 a.m. (29th)
Thursday, July 29 ..	Mildura ..	2 p.m. ..	7.10 a.m. ..	6 p.m.
Friday, July 30 ..	St. Arnaud	11 a.m. ..	7.11 a.m. ..	2.10 p.m.
Tuesday, July 27 ..	Underbool ..	2 p.m. ..	11.32 a.m. ..	7.20 a.m. (28th)
Wednesday, July 28..	Woomelang	p.m ..	12.15 p.m. ..	1.10 a.m. (29th)
Thursday, July 29 ..	Birchip ..	a.m. ..	2.45 a.m ..	Driving
Thursday, July 29 ..	Watchem ..	3 p.m. ..	Driving ..	3.15 a.m. (30th)
Friday, July 30 ..	Donald ..	11 a.m. ..	5.15 a.m. ..	12.25 p.m.
Monday, July 26 ..	Deverish ..	1 p.m. ..	12.31 p.m. ..	8.46 p.m.
Tuesday, July 27 ..	Tungamah ..	11 a.m. ..	9.31 p.m. (26th)	1.21 p.m.
Tuesday, July 27 ..	Yarrawonga	3 p.m. ..	2.5 p.m. ..	7.20 a.m. (28th)
Wednesday, July 28..	Benalla ..	10 a.m. ..	10 a.m. ..	11.25 a.m.
Wednesday, July 28..	Rutherglen	3 p.m. ..	1.53 p.m. ..	7.5 a.m. (29th)
Monday, August 2 ..	Pyramid ..	3 p.m. ..	2.28 p.m. ..	9.30 p.m.
Tuesday, August 3 ..	Koondrook	9.30 a.m.	9.30 a.m. ..	10.30 a.m.
Tuesday, August 3 ..	Kerang ..	2 p.m. ..	11.30 a.m. ..	4.13 p.m
Wednesday, August 4	Swan Hill ..	10 a.m. ..	6.25 p.m. (3rd)	Driving
Wednesday, August 4	Ultima ..	1 p.m. ..	Driving ..	Driving
Wednesday, August 4	Lalbert ..	3 p.m. ..	Driving ..	Driving
Thursday, August 5	Piangil ..	10 a.m. ..	10.25 p.m. (4th)	Driving
Thursday, August 5	Manangatang	1 p.m. ..	Driving ..	Driving
Thursday, August 5	Chillingollah	3 p.m. ..	Driving ..	Driving
Tuesday, August 3 ..	Sea Lake ..	10 a.m. ..	9.25 p.m. (2nd)	Driving
Tuesday, August 3 ..	Kaneira ..	2 p.m. ..	Driving ..	9.54 a.m. (4th)
Wednesday, August 4	Wycheproof	11.40 a.m	11.40 a.m. ..	12.30 p.m.
Thursday, August 5	Quambatook	10 a.m ..	6.23 p.m. (4th)	11.31 a.m.
Thursday, August 5	Boort ..	1 p.m. ..	12.55 p.m. ..	1.35 p.m.
Friday, August 6 ..	Charlton ..	11 a.m. ..	4.7 p.m. (5th) ..	1.35 p.m.
Friday, August 6 ..	Korong Vale	3 p.m. ..	2.56 p.m. ..	3.25 p.m.
Tuesday, August 3 ..	Hopetoun ..	11 a.m. ..	9.55 p.m. (2nd)	7 a.m. (4th)
Wednesday, August 4	Warracknabeal	2 p.m. ..	9.50 a.m. ..	7.50 p.m.
Thursday, August 5	Beulah ..	10 a.m. ..	9.15 p.m. (4th)	11.55 a.m.
Thursday, August 5	Minyip ..	3.30 p.m.	3.18 p.m. ..	11.43 a.m. (6th)
Friday, August 6 ..	Murtoa ..	2 p.m. ..	12.30 p.m. ..	5.50 p.m.

STALLION PARADES, TIME TABLE—*continued.*

Date.	Place.	Time.	Officer Arrives.	Officer Departs.
Monday, August 9 ..	Dookie ...	2 p.m. ..	12.40 p.m. ..	4.10 p.m
Tuesday, August 10	Shepparton ..	10.30 a.m.	5.20 p.m. (9th)	11.38 a.m.
Tuesday, August 10	Cobram ..	2 p.m. ..	1.57 p.m. ..	3.10 p.m.
Tuesday, August 10	Numurkah ..	4.38 p.m.	4.38 p.m. ..	Driving
Wednesday, August 11	Katamatite	11 a.m. ..	Driving ..	Driving
Wednesday, August 11	Nathalia ..	2 p.m. ..	1.37 p.m ..	3.26 p.m.
Thursday, August 12	Murchison ..	10 a.m. ..	7.3 p m (11th)	10.45 a.m.
Thursday, August 12	Rushworth	11.48 a.m.	11.48 a.m. ..	12.25 p.m. (13th)
Friday, August 13 ..	Colbinabbin	1.30 p.m.	1.20 p.m. ..	2.30 p.m.
Monday, August 9 ..	Tallangatta	4 p.m. ..	3.43 p.m. ..	Driving (10th)
Tuesday, August 10	Corryong ..	12.30 p.m.	12.18 p.m. (driving)	2 p.m. (driving)
Wednesday, August 11	Wodonga ..	1.30 p.m.	12.13 p.m. ..	3.5 p.m.
Monday, August 9 ..	Moyhu ..	2 p.m. ..	Driving ..	Driving
Monday, August 9 ..	Whitfield ..	4 p.m. ..	Driving ..	Driving
Tuesday, August 10	Wangaratta	11 a.m. ..	Driving ..	12.39 p.m.
Tuesday, August 10	Bright ..	4.7 p.m. ..	4.7 p.m. ..	6.4 a.m. (11th)
Wednesday, August 11	Myrtleford ..	2 p.m. ..	7.12 a.m. ..	7.12 a.m. (12th)
Thursday, August 12	Beechworth	11 a.m. ..	9.50 a.m. ..	12.51 p.m.
Thursday, August 12	Everton ..	2 p.m. ..	1.11 p.m. ..	3.30 p.m.
Friday, August 13 ..	Euroa ..	10 a.m. ..	6.33 p.m. (12th)	11.12 a.m.
Friday, August 13 ..	Seymour ..	1 p.m. ..	12.11 p.m. ..	8.15 p.m.
Monday, August 16 ..	Maroona ..	3 p.m. ..	2.43 p.m. ..	8.33 p.m.
Tuesday, August 17	Kaniva ..	11 a.m. ..	2.28 a.m. ..	12.42 a.m. (18th)
Wednesday, August 18	Nhill ..	3 p.m. ..	1.22 a.m. ..	1.32 a.m. (19th)
Thursday, August 19	Dimboola ..	2 p.m. ..	2.13 a.m. ..	3.20 p.m.
Friday, August 20 ..	Avoca ..	11 a.m. ..	8.20 a.m. ..	1.40 p.m.
Monday, August 16 ..	Tandara ..	2 p.m. ..	1.3 p.m. ..	7.40 p.m.
Tuesday, August 17	Mitiamo ..	11 a.m. ..	8.29 p.m. (16th)	3.35 p.m.
Wednesday, August 18	Bendigo ..	11 a.m. ..	6.10 p.m. (17th)	12.15 p.m.
Wednesday, August 18	Inglewood ..	3 p.m. ..	1.30 p.m. ..	4.25 p.m.
Thursday, August 19	Castlemaine	11 a.m. ..	7.40 p.m. (18th)	12.56 p.m.
Thursday, August 19	Kyneton ..	2 p.m. ..	1.49 p.m. ..	Driving
Thursday, August 19	Redesdale ..	4 p.m. ..	Driving ..	Driving
Friday, August 20 ..	Romsey ..	11 a.m. ..	10.41 a.m. ..	5.25 p.m.
Monday, August 16 ..	Heathcote ..	2 p.m. ..	11.41 a.m. ..	6.23 p.m.
Tuesday, August 17	Kyabram ..	2 p.m. ..	12.52 p.m. ..	4.25 p.m.
Wednesday, August 18	Tatura ..	10.30 a.m.	5.41 p.m. (17th)	11.44 a.m.
Wednesday, August 18	Echuca ..	2.30 p.m.	2:5 p.m. ..	3.45 p.m.
Wednesday, August 18	Rochester ..	4.30 p.m.	4.25 p.m. ..	9.3 a.m. (19th)
Thursday, August 19	Elmore ..	11 a.m. ..	9.40 a.m. ..	1.40 p.m.
Friday, August 20 ..	Cohuna ..	11 a.m. ..	5.10 p.m. (19th)	12.30 p.m.

STALLION PARADES, TIME TABLE—*continued.*

Date.	Place.	Time.	Officer Arrives.	Officer Departs.
Monday, August 23 ..	Beaufort ..	2 p.m. ..	12.27 p.m. ..	6.47 p.m.
Tuesday, August 24	Larpent ..	4 p.m. ..	3.55 p.m. ..	5.30 p.m.
Wednesday, August 25	Rainbow ..	11 a.m. ..	6.10 p.m. (24th)	2.50 p.m.
Wednesday, August 25	Jeparit ..	4 p.m. ..	4 p.m. ..	10.55 a.m. (26th)
Thursday, August 26	Lorquon ..	1 p.m. ..	12 noon ..	2.50 p.m.
Monday, August 23 ..	Mansfield ..	2 p.m. ..	1.20 p.m. ..	3.30 p.m.
Tuesday, August 24	Yea ..	10 a.m. ..	6.33 p.m. (23rd)	10.33 a.m.
Tuesday, August 24	Alexandra ..	2 p.m. ..	12.25 p.m. ..	4.40 p.m.
Wednesday, August 25	Kilmore ..	10 a.m. ..	9.30 p.m. (24th)	10.36 a.m.
Thursday, August 26	Ballan ..	11 a.m. ..	6.28 p.m. (25th)	12.7 p.m.
Thursday, August 26	Melton ..	2 p.m. ..	1.21 p.m. ..	5.48 p.m.
Friday, August 27 ..	Bacchus Marsh	11 a.m. ..	6.8 p.m. (26th)	12.59 p.m.
Monday, August 23 ..	Camperdown	11.54 a.m.	11.54 a.m. ..	12.25 p.m.
Monday, August 23 ..	Cobden ..	2 p.m. ..	1.10 p.m. ..	3.45 p.m.
Tuesday, August 24	Terang ..	11 a.m. ..	10.22 p.m. (23rd)	Driving
Tuesday, August 24	Mortlake ..	3 p.m. ..	Driving ..	Driving
Wednesday, August 25	Warrnambool	11 a.m. ..	11.32 p.m. (24th)	2.14 p.m.
Wednesday, August 25	Koroit ..	3 p.m. ..	2.42 p.m. ..	12.22 a.m. (26th)
Thursday, August 26	Port Fairy ..	11 a.m. ..	12.52 a.m. ..	1.50 p.m.
Monday, August 30 ..	Daylesford ..	2 p.m. ..	12.4 p.m. ..	3.25 p.m.
Tuesday, August 31	Ballarat ..	11 a.m. ..	6.36 p.m. (30th)	Driving
Tuesday, August 31	Linton ..	3 p.m. ..	Driving ..	Driving
Wednesday, Sept. 1 ..	Clunes ..	11 a.m. ..	8.54 a.m. ..	1.43 p.m.
Wednesday, Sept. 1 ..	Creswick ..	2.30 p.m.	2.16 p.m. ..	Driving
Wednesday, Sept. 1 ..	Smeaton ..	4 p.m. ..	Driving ..	Driving
Thursday, Sept. 2 ..	Maryborough	11 a.m. ..	10.32 p.m. (1st)	12.47 p.m.
Friday, Sept. 3 ..	Navarre ..	9 a.m. ..	7.5 p.m. (2nd) ..	10 a.m.
Friday, Sept. 3 ..	Ararat ..	2 p.m. ..	12.35 p.m. ..	4.20 p.m.
Monday, August 30 ..	Werribee ..	2 p.m. ..	11.47 a.m. ..	5.3 p.m.
Tuesday, August 31	Meredith ..	10 a.m. ..	9.42 a.m. ..	11.13 a.m.
Tuesday, August 31	Geelong ..	2 p.m. ..	12.10 p.m. ..	6.17 p.m.
Wednesday, Sept. 1 ..	Colac ..	10 a.m. ..	8.20 p.m. (31st)	11.15 a.m.
Wednesday, Sept. 1	Beech Forest	3 p.m. ..	2.30 p.m. ..	6.45 a.m. (2nd)
Thursday, Sept. 2nd	Birregurra ..	11 a.m. ..	10.50 a.m. ..	7.53 p.m.
Friday, Sept. 3rd ..	Cressy ..	10 a.m. ..	9.45 p.m. (2nd)	11.5 a.m.
Friday, Sept. 3rd ..	Derrinallum	2 p.m. ..	12.12 p.m. ..	5.7 p.m.
Monday, August 30 ..	Mirboo North	2 p.m. ..	1.50 p.m. ..	4.15 p.m.
Tuesday, August 31	Morwell ..	11 a.m. ..	5.55 p.m. (30th)	11.57 a.m.
Tuesday, August 31	Traralgon ..	2 p.m. ..	12.10 p.m. ..	9.4 p.m.
Wednesday, Sept. 1 ..	Sale ..	11 a.m. ..	10.20 p.m. (31st)	1.50 p.m.
Wednesday, Sept. 1 ..	Maffra ..	4.9 p.m. ..	4.9 p.m. ..	11.8 a.m. (2nd)
Thursday, Sept. 2 ..	Cowarr ..	2 p.m. ..	1.15 p.m. ..	5.1 p.m.
Friday, Sept. 3 ..	Trafalgar ..	10.30 a.m.	6.51 p.m. (2nd)	11.16 a.m.
Friday, Sept. 3 ..	Moe ..	2 p.m. ..	11.31 a.m. ..	6.39 p.m.

STALLION PARADES, TIME TABLE—*continued.*

Date.	Place.	Time.	Officer Arrives.	Officer Departs.
Monday, Sept. 6 ..	Bunyip ..	10 a.m. ..	9.56 a.m. ..	11.25 a.m.
Monday, Sept. 6 ..	Pakenham ..	2 p.m. ..	11.54 a.m. ..	6.2 p.m.
Tuesday, Sept. 7 ..	Neerim South	1 p.m. ..	12.30 p.m. ..	2.10 p.m.
Tuesday, Sept. 7 ..	Warragul ..	3.30 p.m.	3.25 p.m. ..	6.25 a.m. (8th)
Wednesday, Sept. 8 ..	Berwick ..	11 a.m. ..	8 a.m. ..	12.16 p.m.
Wednesday, Sept. 8 ..	Cranbourne	4.37 p.m.	4.37 p.m. ..	8.7 a.m. (9th)
Thursday, Sept. 9 ..	Dalyston ..	2 p.m. ..	10.54 a.m. ..	3.43 p.m.
Friday, Sept. 10 ..	Lang Lang	9 a.m. ..	4.53 p.m. (9th)	9.40 a.m.
Friday, Sept. 10 ..	Dandenong	11 a.m. ..	10.58 a.m. ..	12.39 p.m.
Monday, Sept. 6 ..	Leongatha ..	2 p.m. ..	10.59 a.m. ..	4.7 p.m.
Tuesday, Sept. 7 ..	Foster ..	1 p.m. ..	12.30 p.m. ..	2.21 p.m.
Tuesday, Sept. 7 ..	Stony Creek	3.30 p.m.	3.19 p.m. ..	11.40 a.m. (8th)
Wednesday, Sept. 8 ..	Yarram ..	3.30 p.m.	3.30 p.m. ..	11.30 a.m. (9th)
Friday, Sept. 10 ..	Korumburra	2 p.m. ..	4.45 p.m. (9th)	5.5 p.m.
Monday, Sept. 6 ..	Hastings ..	10.30 a.m.	10.26 a.m. ..	11.27 a.m.
Monday, Sept. 6 ..	Frankston ..	1 p.m. ..	12.7 p.m. ..	2.41 p.m.
Tuesday, Sept. 7 ..	Sunbury ..	2 p.m. ..	1.23 p.m. ..	3.11 p.m.
Wednesday, Sept. 8 ..	Mernda ..	3 p.m. ..	2.48 p.m. ..	8.23 p.m.
Thursday, Sept. 9 ..	Lilydale ..	3 p.m. ..	1.48 p.m. ..	5.31 p.m.
Tuesday, Sept. 14 ..	Omeo ..	3 p.m. ..	Driving ..	Driving (15th)
Wednesday, Sept. 15	Bruthen ..	3 p.m. ..	Driving ..	11.53 a.m. (16th)
Thursday, Sept. 16th	Bairnsdale ..	12 noon ..	11.15 p.m. ..	2.25 p.m.
Tuesday, Sept. 14 ..	Orbost ..	2 p.m. ..	8.35 p.m. (13th)	8.50 a.m. (15th)
Saturday, Sept. 20th	Royal Show	1.30 p.m.		
Monday, Sept. 22nd	,, ,,	9 a.m.		

BRANDING AND EAR-MARKING STOCK.

By W. A. N. Robertson, Chief Veterinary Officer.

For many generations branding or ear-marking has been recognised as the only practical means of establishing identity of stock, but unless the use of particular brands or marks is supported by law their value as means of identification of any beast is incomplete, and legal ownership cannot be established. For instance two or more persons in the State, perhaps in the same district, may use identical brands. Therefore, unless the system of branding is controlled by a Brands Act (as is done in all the States of the Commonwealth, with the exception of Victoria), the presence of a brand, whilst it may be accepted as evidence for what it is worth, is not legal proof of ownership. The difficulties met with in the conduct of prosecutions for alleged stealing have frequently been referred to by the Courts of Victoria and the absence of a Brands Act adversely commented upon. The necessity for such a measure is now recognised by all practical men, and several efforts have been made to introduce legislative control.

During last session of Parliament a Brands Bill was passed by the Legislative Assembly, and on reaching the Legislative Council was referred to a Select Committee, which recommended in its report to the House—

(1) That the Bill be not further proceeded with that session.
(2) That a copy of the Bill, together with full explanatory notes, be sent to each agricultural society and to other interested bodies with a view to obtaining their opinion on the Bill.
(3) That the Chief Veterinary Inspector take advantage of the next Convention of the Chamber of Agriculture to explain the provisions of the Bill to delegates.

The one great difficulty in the past which has prevented the passing of a Brands Act in Victoria has been the fact that, under existing systems, the number of marks or brands—but particularly the former—which are available are insufficient to provide each applicant with a distinctive mark. In other States the difficulty has been overcome by providing for different districts and duplicating the series of marks. In New South Wales there are at present 67 different sheep districts. The difficulties which result from such a system are not very evident in a State like New South Wales with its vast area, but in Victoria, with the constant interchange of sheep from one district to another, such a method would lead to considerable confusion.

In providing a sufficient number of brands the difficulty is overcome by the use of a three-piece brand, *i.e.*, two letters and a numeral or two numerals and one letter—the combination which can be made from three such signs being very large. To introduce such a system in Victoria would require the discovery of a new combination in order to distinguish from three-piece systems now in vogue, otherwise we would be using a duplication of a system of another State. One great disadvantage of such a method is that the size of the signs must be large to avoid confusion, and the resulting loss from depreciation of hides is very considerable.

Information received from the United Tanners' Federation of Great Britain and Ireland indicates that on pre-war prices the loss on Australian hides owing to the damage done by the brands now used amounts

to 6d. per lb., or from 5s. to 7s. 6d. per hide, a total loss of approximately £500,000 per annum to the stock-owners of Australia. At the present rates ruling for hides the loss is quite double.

The necessity for legislative control and the difficulties to be overcome in Victoria led me to try to devise a plan whereby a sufficient number of brands and ear-marks could be supplied to provide each and every applicant with a distinctive brand or mark. After a considerable amount of time and thought given to the matter, a scheme has been devised which will supply, if necessary, a separate and distinct mark or brand to every stock-owner in Australia. A patent has been applied for the method, which is described as—

Robertson's Method of and Means for Branding and Earmarking Stock.
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The scheme is essentially a numerical one; signs or symbols are used to indicate various values, and by addition the registered number of the owner of the brand or mark is quickly ascertained.

Ear-Marking.

The ear of any beast may be so divided as to establish different positions. For the purpose of this method these are set forth in Plate I., and are referred to as 1st, 2nd, 3rd, 4th, 5th, and 6th position. To each position a value is given which is respectively 1, 2, 4, 8, 16, and multiples to 96, and 1,600 and its multiples. It is necessary to firmly establish in the memory these positions and their values. Different marks are now used in these positions.

Fig. 2 shows the unit notch; it is used in any or all of the first four positions and in no other.

Fig. 3 shows the notch in the 1st position and the value of the mark is one.

Fig. 4 shows the notch in the 2nd position and the value is two.

Fig. 5 shows the notch in the 1st and 2nd position and the value is three.

Fig. 6 shows the notch in the 3rd position and the value is four.

Fig. 7 shows the notch in the 1st and 3rd position and the value is five by adding four and one.

Fig. 8 shows the value six by adding four and two.

Fig. 9 shows the value seven by adding four, two, and one.

Fig. 10 shows the value eight the unit notch in the fourth position.

Fig. 11 shows the value nine by adding eight and one.

Fig. 12 shows the value ten by adding eight and two.

Fig. 13 shows the value eleven by adding eight, two, and one.

Fig. 14 shows the value twelve by adding eight and four.

Fig. 15 shows the value thirteen by adding eight, four and one.

Fig. 16 shows the value fourteen by adding eight, four and two.

Fig. 17 shows the value fifteen by adding the unit notch in each position—8, 4, 2, 1.

The number 16 is the next one required. This is provided for in position 5 at the tip of the ear, and a swallow is used. Whenever this is present 16 is added to any other marks. With 16 showing in the tip (Fig. 18) the unit notch may then be used in any of the positions 1 to 4, to add as previously shown a further 15 or a total of 31. The

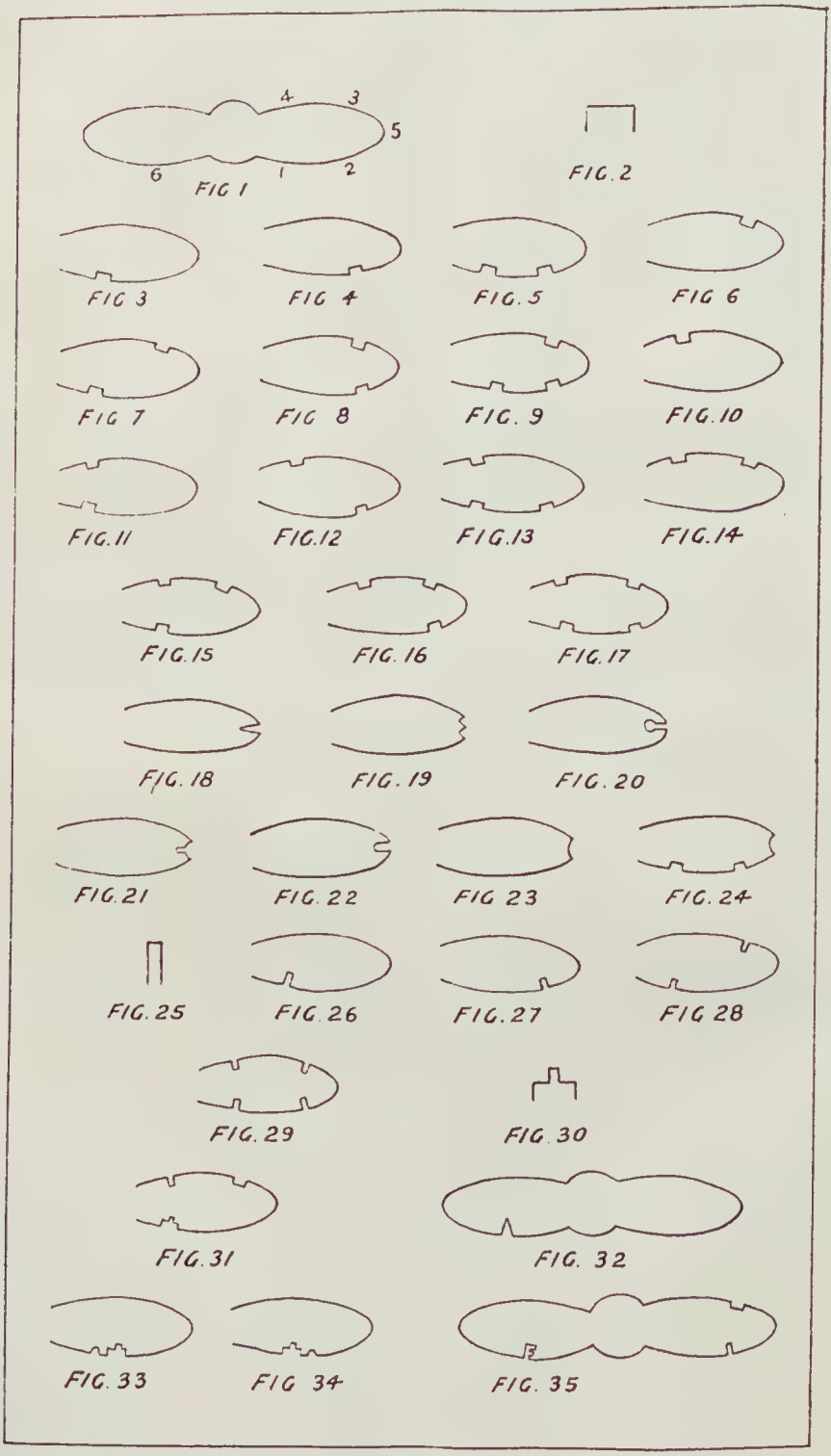

4
3
5
6
1
2
FIG 1
FIG. 2
FIG 3
FIG 4
FIG. 5
FIG 6
FIG 7
FIG 8
FIG. 9
FIG. 10
FIG. 11
FIG. 12
FIG. 13
FIG. 14
FIG. 15
FIG. 16
FIG. 17
FIG. 18
FIG. 19
FIG. 20
FIG. 21
FIG. 22
FIG 23
FIG. 24
FIG. 25
FIG. 26
FIG. 27
FIG 28
FIG. 29
FIG. 30
FIG. 31
FIG. 32
FIG. 33
FIG 34
FIG. 35

Plate I.

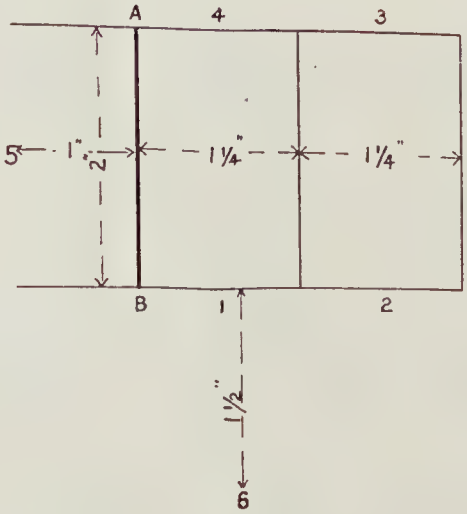


FIG 36

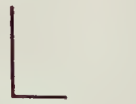


FIG. 37

FIG. 38

FIG. 39

FIG. 40

FIG. 41

FIG. 42

FIG. 43

FIG. 44

FIG. 45

FIG. 46

FIG. 47

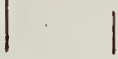


FIG. 48

FIG 49

FIG. 50

FIG 51

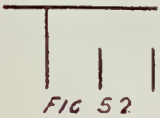


FIG 52

FIG 53

FIG 54

Plate I.

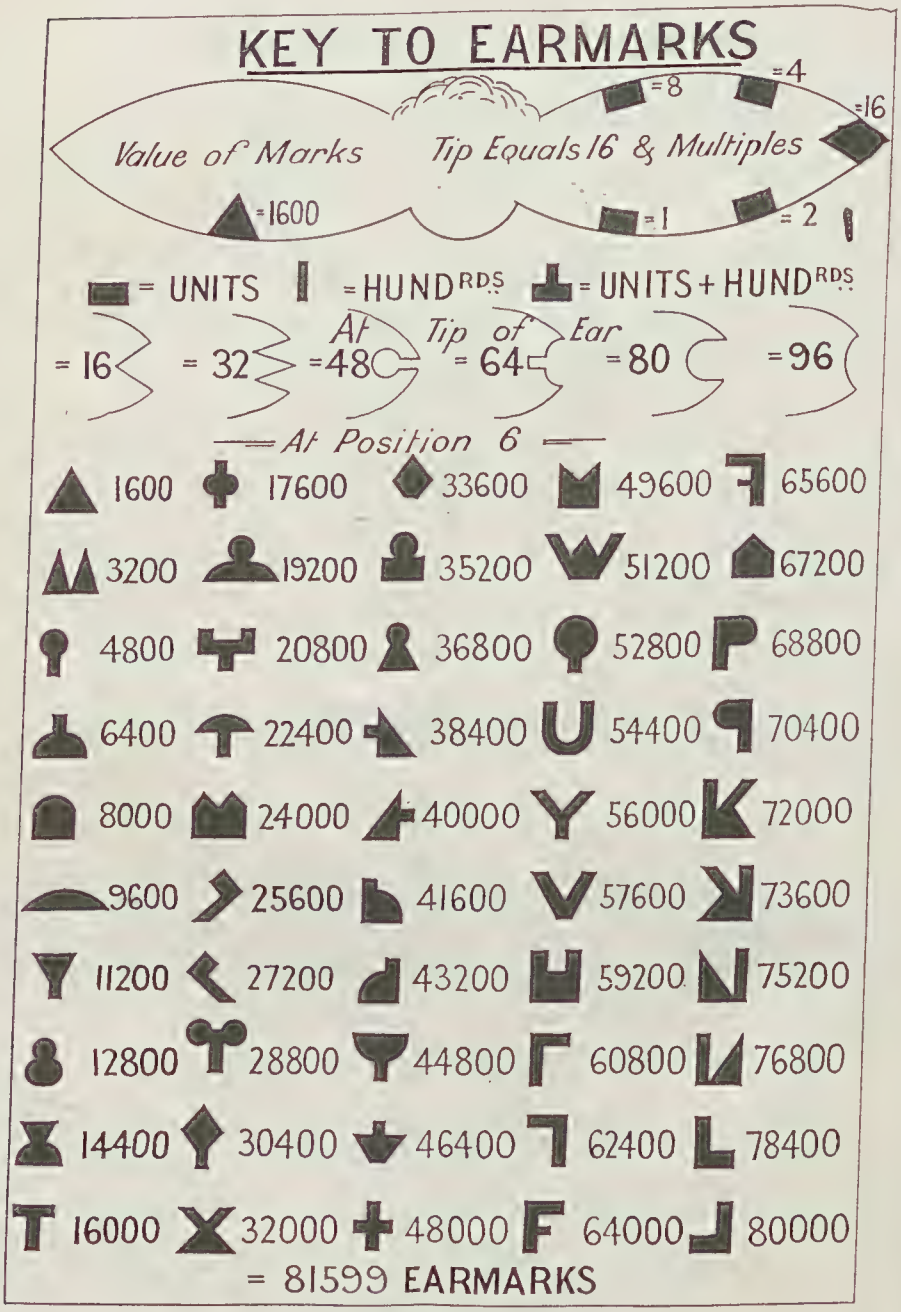
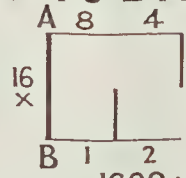

KEY TO EARMARKS
Value of Marks
Tip Equals 16 & Multiples
=4
=8
=16
=1600
=1
=2
= UNITS
=HUNDRDS
= UNITS + HUNDRDS
= 16
= 32
At =48
Tip of = 64
Ear =80
=96
At Position 6
1600
17600
33600
49600
65600
3200
19200
35200
51200
67200
4800
20800
36800
52800
68800
6400
22400
38400
54400
70400
8000
24000
40000
56000
72000
9600
25600
41600
57600
73600
11200
27200
43200
59200
75200
12800
28800
44800
60800
76800
14400
30400
46400
62400
78400
16000
32000
48000
64000
80000
= 81599 EARMARKS

Plate II.

KEY TO BRANDS



VALUE OF POSITIONS

LINE A.B. IS ZERO & IS PRESENT IN EVERY BRAND

1600 ×

HORIZONTALS TO RIGHT OF ZERO = UNITS

PERPENDICULARS " " " " = HUNDRDS

HORIZONTALS TO LEFT OF ZERO HAVE FOLLOWING VALUES

16 32 48 64 80 96

— AT POSITION 6 —

A 1600	L 17600	X 33600	C 49600	65600	Y 81600
B 3200	M 19200	Y 35200	51200	67200	83200
C 4800	N 20800	36800	52800	68800	W 84800
D 6400	O 22400	38400	54400	70400	86400
E 8000	P 24000	40000	56000	72000	88000
F 9600	R 25600	41600	57600	73600	89600
H 11200	S 27200	43200	59200	75200	91200
I 12800	T 28800	44800	60800	76800	M 92800
J 14400	U 30400	46400	62400	78400	94400
K 16000	W 32000	48000	64000	80000	96000

97,599 BRANDS

Plate III.

next multiple of 16, viz., 32, is now required, and this is obtained by a double notch (Fig. 19) at the tip of the ear, and again, with this having a value of 32, the units 1 to 15 may be added until 47 is reached. 48 is provided for by the mark as shown in Fig. 20, and again additions may be made, and so on for each of the multiples of 16, viz., 32, 48, 64, 80, and 96 as shown Figs. 18 to 23. These six marks only and no others are used in the tip.

These marks and their value require to be memorized. With 96 showing at the tip of the ear we can now add three as shown in Fig. 24 and the value of the mark is 99. One hundred is the next value required, and this is provided for by using a straight, deep notch as shown in Fig. 25. If in the first position it is 100 (Fig. 26), this notch in any of the positions 1 to 4, and in no other, may be used in the same manner as the unit notch to make values up to 1,500.

Fig. 27 shows 200, Fig. 28, 500, and Fig. 29, 1,500. It is thus seen that the units and hundreds are shown in the same positions, but by a different notch. If a unit and hundred are required in the one position a combination mark as in Fig. 30 is used, and both unit and hundred are thus shown. Fig. 31 shows an ear-mark with one of each of the three marks used—800+101+4=905. In reading any ear-mark it is advisable to take the highest number first, viz., the hundreds, then the sixteens and finally the units.

By a combination of this system of building, numbers up to 1,599 are formed in the first five positions. 1,600 is next required, and this is provided for by passing to the opposite ear, to position six, and using a swallow similar to that made for 16 at the tip—Fig. 32 shows 1,600. In this position the mark changes at every 1,600, and 1,599 is added in the other ear. The first six signs in this position are the same as used in position 5 and the numbers 1,600, 3,200, 4,800, 6,400, 8,000, and 9,600 are so formed. After this number is reached a small key is required to show the value of the marks used in position six. From the key reproduced on page 288 (Plate II.), the number of the ear-mark shown in Fig. 35 will be seen to be 64,000+200+4, or 64,204.

The important points to remember in this method are shown in the Key to Ear Marks, viz., the values of the different positions, the three notches used for units and hundreds, and the six notches used at the tip of the ear.

A drawback to using positions in the ear is that the careless marker may put his mark in the wrong position. To guard against this possibility it is provided that wherever a single notch is used, a small notch will be placed beside it termed the Indicator, which will show the supposed centre of the ear as shown in Figs. 33 and 34. The small notch, Fig. 33, being the approximate centre, makes the mark 202 while Fig. 34 is 101. If a double notch is being used the indicator is not necessary, as both positions will be in use, even if both are well towards the tip of the ear.

Branding.

In branding the same method is followed with slight modifications due to the fact that there is no head to form a starting point or tip to use for the multiple of 16. The differences are overcome by providing a line A B (Fig. 36) and referred to as Zero. *This is present in every brand, but has no value other than indicating a commencing point.* From this line positions may be established just as in ear-marking at

1, 2, 3, 4, 5 and 6. The values of these positions are 1, 2, 4, 8, 16, and multiples and 1,600 and its multiples. Lines drawn at right angles to Zero (A B) on the right are units—

Fig. 37 equals value one.
„ 38 „ „ two
„ 39 „ „ two and one.
„ 40 „ „ eight.

In this manner numbers may be provided, as in ear-marking, to 15. 16 the next number necessary is formed by using a line at right angles to Zero on the left (Fig. 41). Then units are used on the right until the next multiple of sixteen is reached. As it is necessary to remember six marks in the tip of the ear for multiple of sixteen so it is necessary to remember six marks on the left of Zero for the same purpose. Fig. 42 equals 32. Fig. 43 equals 48, Fig. 44 equals 64, Fig. 45 equals 80 and Fig. 46 equals 96. Hundreds are next required and they may be provided for by perpendicular lines in any of the first four positions to the right of Zero. Fig. 47 represents 100, Fig. 48, 200, and Fig. 49, 1,000, *i.e.*, 800 + 200. A line in each of the positions would be 1,500 as in Fig. 50. Fig. 51 represents 998 made up thus—800+100+96+2. Fig. 52 shows 100+200+16+12=328. A line in each position for both units and hundred as in Fig. 54 equals 1,515. When 1,600 is reached a letter or figure is used in position 6 for every multiple. To know the value of each letter a small key is necessary (Plate III.). From this it will be seen that ⋗ is valued at 36,800, therefore Fig. 53 represents the number 36,800+16+1=36,817.

Disadvantages of Method.

The first disadvantage of the method noted in ear-marking is that some of the numbers require five marks in one ear, and though these five are made with only three cuts of pliers they are on occasion excessive. This difficulty may, however, be avoided, for the brand or ear-mark being interchangeable will allow that any number requiring so many marks need not be allotted as an ear-mark, but should be reserved for use of a person who brands only. A further disadvantage is that an owner may require to have three or four pair of pliers and so apparently the ear-mark would be expensive. To meet this disadvantage provision was made in the Bill passed by the Legislative Assembly last year for a uniform price for pliers required for any individual ear-mark; that is, it provided that a person requiring only one pair for his ear-mark would pay the same price as the person who required even four pairs, the latter obtaining them below cost, the former above. So that no advantage would be gained by one person over another on this head.

The advantage of having an absolutely distinctive ear-mark is considered by all who have inquired into the system to far out-weigh the disadvantages. The method suggested would in some cases take a little longer to carry out than the present haphazard way, but it must not be forgotten that it would give a mark which no one else could legally use, and an animal once ear-marked could always be traced to its breeder, not to one of perhaps a dozen others using the same mark. To a man who has a large number of stock to mark, a number requiring few cuts would be allotted so that time would not be lost, while, by the owner with perhaps only 100 to mark, the extra time required for the use of three pairs of pliers would not be noticed.

Advantages of Method.

First and foremost is the distinctive brand or ear-mark which would for all time establish who was the breeder. Next that the ear or portion of ear not occupied by the registered number is available for other marks if the owner requires, such as age or cull marks, provided always that the fundamental marks as in Figs. 2, 25 and 30 are not used. Permission to use an additional private mark would have to be obtained so as to insure that the registered number was not confused or some other registered number constructed. For example, take the ear in Figs. 10, 14, 18, &c., as long as the fundamental marks were not used

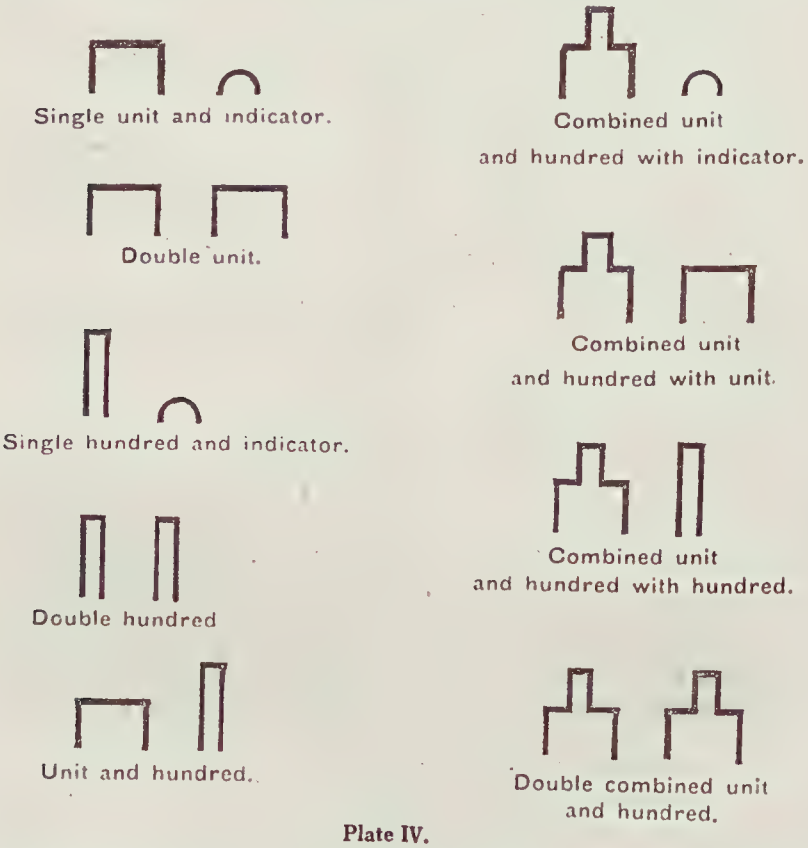


Plate IV.

the ear could be filled with age notches and still the registered number would be clearly read.

A further advantage is the simplicity of the method. Within ten minutes any person by close attention can learn to read the symbols into their correct number. This has been practically demonstrated in the case of children and adults. It is necessary to read all marks as numbers and unnecessary to confuse the mind by determining or referring to the kind of notch other than that signifying "unit" or "hundred." The key to the system as shown on pages 288 and 289 is small, yet complete, and provides for more marks and brands than will be required in Victoria for many years. The register required is

simple in the extreme, an alphabetical list of owners and a numerical list of marks being all that is necessary and from this ready references will be obtainable.

At first sight it might appear that there would be difficulty in placing the marks in their correct positions and that the ear would be likely to be disfigured, but by the aid of the indicator already referred to (Figs. 33 and 34) the former objection is overcome and by using only one pair of pliers to make the two marks necessary in either the front or back of ear, the marks need never be larger than as shown in Plate IV., both marks being included in a space of 1 inch by 7/16th inch deep.

Both ear-marks and brands would be difficult to fake. In the former case it would be almost impossible for a person to add the hundred notch to the unit one so that it would be in the exact centre and at right angles, and, further, the proportionate growth of the mark would not be in unison. For instance, if the unit were placed on the ear before the animal was six months' old and the hundred were added after twelve months, the growth or change in the unit mark would not correspond with that of the hundred mark. The same difficulties would be met with in altering brands. It would be almost impossible to add a line of the correct size at right angles or parallel to Zero, which would grow so as to seem part of an existing brand.

In order to guard against "faking," the draft Bill provided that the ear-mark or brand should be *primâ facie* evidence of ownership; consequently it would be useless for any one to alter a mark unless he could convert it into his own mark and the chance of his being able to do this would be remote.

The possibility of blotching of brands or marks is reduced to a minimum, and should it occur, it would not make the mark indecipherable. No matter what change takes place in the ear, the marks as at Figs. 2, 25, 30, could not become confused with one another. In branding—even if the brand were very indistinct—the correct number could be constructed. For example, in the accompanying diagram, if only marks as shown by the heavy lines were visible, the brand could be reconstructed as shown by the dotted lines, for the visible marks

would indicate which lines were originally meant to be present. The remaining lines in the diagram would show that the number was 537.

If the Bill Becomes Law.

Presuming the method is considered satisfactory and the Bill becomes law, every stock-owner will require to apply for a brand and ear-mark. A number will then be allotted to him, and it will be transposed into its proper mark. It will not be necessary to use both, brand and mark, but one or other will require to be shown on all natural

increase and unbranded stock which come into any owner's possession. The fee for registration is on a sliding scale—

If less than 100 head of stock on the run ...	10s.
If there are 100 and less than 1,000 ..	20s.
If more than 1,000	40s.

One registration is all that will be required to cover both brand and ear-mark and this will be the only registration necessary and will give the owner sole right to use the brand or mark allotted him. The fees received during the first year (provided all stock-owners register) will represent a sum of approximately £60,000, but it must be remembered that this amount will be required to cover the cost of administration for all time, and that it will include the issue of registers to pound-keepers and police in order that stray or impounded stock may be returned to their rightful owners. Therefore the total must not be considered as high, and the average fee (say, 20s.) will be an insurance for all time.

The Bill provides that none but a registered brand or mark must be used, that is, a person must either register or keep clean skins, but if the owner of a registered brand desires to use a brand which he has been in the habit of using in the past he may apply for the right to continue the use thereof, and provided always the brand is one which will not interfere with or confuse the registered brand, permission to use the same will be granted. It is anticipated that the use of such additional brand will be quickly discontinued as the registered brand becomes known, and that even the brand will seldom be used by the breeder who will rely on the ear-mark for identification.

It will be necessary for owners to use only certain positions for branding, and to follow such positions in rotation. The order in which they must be used is stated in the Bill. This is essential in order to establish ownership, for if an owner were not required to brand his cattle in a rotation system, it would be difficult, in the event of two or more brands being found on a beast, to decide who was the rightful owner, or who had placed the last brand on any animal.

HOW A PURE-BRED FRIESIAN BULL WILL MAKE MONEY FOR YOU.

The Iowa Experiment Station recently conducted an experiment under the direction of Prof. L. S. Gillette. A purebred Friesian bull was mated to scrub cows, and the resulting heifers were bred to another pure-bred Friesian bull. Here's what happened:—Dams' average yield, 3,255 lbs. of milk, 161 lbs. of fat; daughters' average yield, 6,313 lbs. of milk, 261 lbs. of fat; granddaughters' average yield, 11,295 lbs. of milk, 431 lbs. of fat. In other words, the daughters of the pure-bred Friesian bull averaged 94 per cent. more milk and 62 per cent. more fat than their dams, and his granddaughters averaged 245 per cent. more milk and 163 per cent. more fat than the original scrub dams. The short cut to greater dairy profits is a purebred Friesian bull. Think it over.—*New Zealand Dairyman,* 20th March, 1920.

CROP AND FALLOW COMPETITIONS, MINYIP, 1919.

Copy of Report of Judge, Mr. H. A. Mullett, B. Ag. Sc., Chief Field Officer, Department of Agriculture.

I have much pleasure in submitting my report as judge of the recent Crop and Fallow Competition at Minyip.

I dealt fully with the objects of the competitions last year. I would like to remind the farmers that the Agricultural Society hopes to improve by these competitions the farming methods of the district. The immediate object is to discover the best crops each year, and to account as far as possible for their superiority. Just to the extent that farmers are willing to help themselves in this matter so will the worthy object be achieved.

The season was one in which heavy crops were not plentiful, yet it was just the sort of season to throw the best farms into strong relief. The highest skill is required to grow a crop in a season like that just past, yet many good farmers are short-sightedly deterred from exhibiting their crops on the plea that they are not good enough.

The Season.

The official records set down the rainfall as 15½ inches, which is equal to the average for twenty years, but of this only 8½ inches fell in the growing period of wheat, or 4 inches below normal for that period. Three and a half inches fell in February and March, and the balance in December.

Considering the meagre effective rainfall, it is remarkable that the crops have yielded so well. There was a time when a rainfall of this character would have meant a harvest failure, but to-day the crop is rendered to a certain extent less dependent on the rain which falls while it is growing than by the moisture conserved in the fallow from the year before, and the good crops were seen this season where the farmer best understood the secret of doing this effectively. At Minyip, as elsewhere in the Wimmera, the careful working of the fallows after the February and March rains had an important influence on the yields of the crops.

Results—Crops.

Section I.—For Best Exhibited Half of Farmer's Wheat Crop on Fallowed Land (the Half not less than 50 Acres).

Name.	Variety.	Yield.	Purity and Trueness to Type.	Disease.	Weeds.	Evenness.	Total.
Possible Points		**35**	**20**	**15**	**15**	**15**	**100**
A. A. Lutze	Known locally as "Huff's Imperial" indistinguishable from Gallipoli	26	16	12	12	14	80

There was only one competitor in this section. The wheat was a variety called "Huff's Imperial," and is indistinguishable from the new departmental crossbred "Gallipoli." It was level and characteristically short. A fair number of strangers was present. The yield was exceptionally heavy for the season, and in every respect it was a most creditable crop.

It was grown on winter fallow, which had been given the following treatment:—The paddock was scarified in July, and then harrowed; in the spring a further scarifying was given. After harvest it was harrowed twice, and then spring-toothed, after falls of summer rain, and finally spring-toothed and drilled at the end of May and beginning of June with 60 lbs. of wheat and 85 to 90 lbs. of superphosphate. The young growing crop was fed off to sheep for a fortnight at the end of July. Special precautions were taken to harrow the crop after removing the sheep.

Messrs. Brown Bros.' Winning Crop of Federation.

SECTION IV.—FOR BEST CROP GROWN ON FALLOW LAND—THE FALLOW JUDGED ON POINTS, 1918, AND THE CROP GROWN ON THIS FALLOW, 1919.

(Crop points and fallow points to be added together.)

Name.	Variety.	Yield.	Type.	Disease.	Weeds.	Evenness.	Total for Crop.	Total for last year's Fallow.	Grand Total.
Possible Points ..	.. .. ..	**35**	**20**	**15**	**15**	**15**	**100**	**100**	**200**
Brown Bros. ..	Federation ..	24	18	13	12	14	81	95	176
A. A. Lutze	Gallipoli ..	26	15	12	12	14	79	96	175
A. H. Krelle	Federation ..	24	16	5	14	14	73	91	164
R. J. Hemphill ..	Federation ..	15	18	10	14	13	70	92	162
W. and J. Mackenzie ..	Federation ..	18	16	5	14	13	66	89	155

The winning crop of Federation in this section—that of Messrs. Brown Brothers—though not quite so heavy as that of Mr. Lutze, nevertheless was much truer to type, and on the whole it was considerably freer from flag smut and takeall. In one corner there was, however, a fair amount of mustard weed.

This crop was grown on summer fallow, which had been scarified in March, and ploughed in July and August to 4 inches deep. In the spring it was rescarified and then harrowed. After harvest the paddock was scarified again after the summer rains; a portion was then re-scarified, and finally the whole paddock was re-scarified and sown in June and early July. It was harrowed after the drill, 75 lbs. of Federation seed which had been obtained from a seed station several years ago and 90 lbs. of superphosphate to the acre being used.

Mr. Krelle's crop was on winter fallow which had been thoroughly worked, and it was sown with the combined springtooth cultivator-drill 75 lbs. of seed and 112 lbs. of superphosphate. Points were heavily deducted because the crop was smutted, as was also the case with Mr. Mackenzie's crop.

Mr. Hemphill's crop, though very short, was well headed. It was sown on summer fallow that had been twice ploughed. It is probable that this fallow was by the second ploughing rendered too open and loose, especially in the dry season which followed. It certainly appeared so at the time of judging last November.

Results—Fallow.

Section II.—For Best Fallowed Land not less than 100 Acres. All Competitors' Fallow to be Shown.

Name.	Soil.	Moisture.	Mulch.	Weeds.	Cultivation.	Total.
Possible Points ..	.. .. ..	**25**	**25**	**25**	**25**	**100**
A. A. Lutze	Black	23	24	24	22	93
A. H. Krelle	Black, red patches ..	22	22	23	21	88
R. J. Cowan	Black	19	23	24	21	87
W. and J. Mackenzie ..	Black	20	22	23	21	86
R. J. Hemphill ..	Black, red patches ..	19	21	24	22	86
H. W. Morris	Black, red banks ..	19	21	23	20	83

Mr. Lutze showed in all 318 acres of fallow, 160 acres of which were summer fallow, and the balance winter fallow. The whole had a nice mellow blanket of loose dust over a well-consolidated seed bed. The moisture content was excellent. There was practically a complete absence of weeds, and judgment had been displayed in reducing the whole of the land to an even tilth of good character.

As far as could be judged by the tracks and an examination of the "sole," the cultivating implements had been carefully manipulated, and attention had been given to an even regulation of depth, and the prevention of misses, or too great an overlap.

The summer fallow, which exhibited the highest moisture content, had received the following treatment:—It was ploughed in March to a depth of 4½ inches—having been ploughed more shallowly on the previous occasion—the idea being to plough the land alternately deep and shallow. Subsequently it was harrowed in July, and scarified at the end of August, and again in October.

Mr. Krelle's paddock of summer fallow was also high in moisture, but the mulch being somewhat more shallow than that of Mr. Lutze, the subsoil was beginning to crack with consequent loss of moisture. Points were also deducted for somewhat uneven cultivation of the red patches. The paddock was ploughed in March to 3 inches, and received the following treatment subsequently. Harrowed at beginning of May, again early in July, scarified about the end of July, harrowed second week in August, scarified first week in November, and finally harrowed during the third week in November. The paddock was on the whole highly creditable.

Mr. Cowan's fallow, though attractive in appearance on the black ground, was nevertheless somewhat deficient in moisture. It was winter fallow, and had been well worked. The paddock of red ground was not in good condition.

The remaining fallows were mainly deficient in moisture, generally arising from imperfect mulching. In some cases, however, the actual rainfall since fallowing time had been more favorable than in others.

Mr. Ruwolt Harvesting a Crop of Gallipoli Wheat.

SECTION III.—BEST CROP GROWN ON FALLOW LAND—THE FALLOW TO BE JUDGED ON POINTS, 1919, AND THE CROP GROWN ON THIS FALLOW. TO BE JUDGED ON POINTS IN 1920.

(Crop and fallow points to be added together.)

Name.	Soil.	Moisture.	Mulch.	Weeds.	Cultivation.	Total.
Possible Points ..	.. .. ..	**25**	**25**	**25**	**25**	**100**
A. A. Lutze	Black	23	24	24	22	93
J. Ruwolt	Black	22	23	24	21	90
A. H. Krelle	Black, red patches ..	22	22	23	21	88
R. J. Cowan	Black	19	23	24	21	87
R. J. Hemphill ..	Black, red patches ..	19	20	24	23	86
H. Morris	Black, red banks ..	19	21	23	20	83

In this section the prize will not be awarded till next season, when the aggregate of the points for fallow and the crop grown on it will determine the winner. The whole of the competitors in this section, with the exception of Mr. Ruwolt, are the same as in section II., and their fallows have already been discussed.

Mr. Ruwolt's fallow had been deeply mulched, and consequently was high in moisture. Points were lost for cultivation, the surface being left very deeply furrowed by the scarifier. The paddock, 140 acres, was ploughed in March, then scarified in July and August, and again in September.

The Trend of Wheat-growing Methods in the Wimmera.

It is somewhat difficult this season, in view of the rather patchy character of the rainfall and the relatively limited number of entries, to make accurate deductions from a survey of the crops and fallows seen at Minyip. But in a general way interesting deductions may be made of a survey of the whole of the crops seen in the Wimmera this year.

Summer Fallow.

During the past few years increasing interest has been shown in the summer or fifteen months' fallow on the black soils. At the competitions in the various Wimmera districts during the years 1917 and 1918, wheat crops grown on summer fallow were on the average markedly superior to those grown on winter fallow, but this year, though the summer-fallowed crops have held their own in the five Wimmera districts inspected, they have not done any more than that. It is often claimed that the apparent superiority of summer fallow is due to the extra advantages that it offers for conserving moisture, and this is undoubtedly the case. From this it ought to follow that the greatest advantages would accrue to the crop in a dry season, and on the face of it, it is somewhat difficult to understand why this was not so this year.

Several wheat crops were seen on summer fallow which had been twice ploughed, and well worked in addition; they were generally very moderate crops, and the soil on which they were grown was exceptionally loose and open. This suggests that care should be taken in a dry year to avoid working summer fallow too often with heavy implements, though experience shows that any black fallow can hardly be worked too much after rain.

Apart from the question of yield, two of the advantages of summer fallow are, first, the utilization of the farm labour and horses at a time when it would be otherwise idle, thus easing the strain on the plant at ploughing time, and, secondly, that the summer fallow is the best method of cleaning black land of weeds.

The best Wimmera farmers are finding that it pays to summer fallow a portion only of their land each year. So far there is no definite information as to the comparative yields of the two methods over a series of years, but it is possible that tests will be made on the Experimental Field at Longerenong College in the near future.

Rate of Seeding and Time of Sowing.

The modern tendency on the black soils of the Wimmera is strongly in favour of sowing wheat later than was once the practice, though this year the early-sown wheats were the best. At Nhill and Kaniva May sowing is still preferred, but to the south and east the tendency is to defer sowing till later. The advantages claimed for June and July sowing are that opportunity is afforded of getting a more thorough germination of rubbish than is possible with a May sowing, and that the land can be worked down to a much more satisfactory physical condition. This experience of practical farmers has been definitely corroborated on the Departmental Experimental Plots at Longerenong College over the four years, 1915-1918, inclusive. There July sowings with 60 lbs. of Federation wheat and 1 cwt. of superphosphate have averaged 4½ bushels per annum better than May sowings.

The later sowing is rightly accompanied by an increased dressing of seed, because the later the season the greater the losses which are likely to result in germination. The sowing of 75 to 80 lbs. of wheat is becoming general, and the practice has spread to the districts where May sowing is the rule. It must be confessed that, judging by the large numbers of excellent heavy-seeded crops seen during the past few years, the practice even in these districts appears to be sound. Here again the Longerenong Experimental Plots support the practice. Over the same period, viz., 1915-1918, a 15-lbs. increase in the rate of seeding over the normal 60 lbs. has resulted in an average increase of 2¾ bushels per annum per acre, and there are indications that for the late sowings even heavier seedings will be profitable.

It might be expected that heavy-seeded crops would be likely to suffer severely in a dry season like the present, but such was not the case. Most of the crops occupying prominent positions in the five Wimmera districts where crop and fallow competitions were held this year were heavily seeded. Included in them are those of Messrs. Brown Brothers and A. H. Krelle, of Minyip; Robert Blackwood; and A. J. Buckley, of Nhill; whilst the heaviest Mallee crop at Dimboola, that of Mr. J. Glatz, was sown with 1½ bushels of seed and 112 lbs. of superphosphate.

Manures.

The most reasonable explanation of the payable response of Wimmera soils to heavier seedings seems to be in the increased supplies of plant food which are liberated in modern well-worked fallows. There would be no justification whatever for increasing the seeding on badly-worked land, and the increase should be accompanied by heavier dressings of superphosphate, which is the most deficient element in the soil.

The experience on the plots at Longerenong, Warracknabeal, and elsewhere demonstrates beyond all doubt that applications of 112 lbs. of superphosphate with the seed are more profitable than the usual dressing of ½ cwt.

The average increased yield resulting from an increase of 56 lbs. of superphosphate is in the vicinity of 1½ to 2 bushels of wheat to the acre, which will pay for the extra manure and leave a bushel or so as clear profit. The extra feed in the stubbles which always accompanies the heavy dressings is also highly profitable.

On land which has been drained of phosphorus by prolonged cropping and systematically starved of superphosphate, much heavier returns than these might be expected for the first few years. The behaviour of crops sown with heavy dressings of superphosphate this year should dispel the last doubt in farmers' minds that extra superphosphate "burns off the crop in a dry year."

Sheep Feed.

Minyip is the home of the Wimmera Rye Grass. In view of the claims that have been advanced of its high carrying capacity in normal years, the following particulars of the stock carried at Messrs. McDougal's, Minyip, and on the farm of Mr. A. W. Milbourne, Ailsa, Warracknabeal, may be of interest, as showing the carrying capacity under adverse conditions. Messrs. McDougal, of Minyip, supply the following figures:—

The area under the grass is 1,000 acres; crop, 300 acres; fallow, 150 acres.

Upon the grass the following sheep have been maintained:—Seven hundred ewes were "lambed down," and these with 400 of last year's weaners from last year's lambing were carried forward until September, when 50 ewes and 50 weaners were sold. They topped the Ballarat market, the ewes averaging 43s., and the weaners 27s. Subsequently a further truck of 100 lambs was sold for 20s. 4d., also topping the market. In November 402 lambs and 48 ewes were sent to Murtoa; the ewes averaged 60 lbs. dressed weight, realizing 19s. 5d., and the lambs 28-35 lbs., averaging 27s. 6d. The property at the time of judging (first week in December) was therefore carrying 600 ewes, 350 weaners, and 300 lambs. There was sufficient of the grass, together with the wheat stubbles, to carry these sheep well, the bulk of which were in prime condition, though they could not be profitably disposed of just then owing to a falling market.

At the Minyip Show prizes were taken for (1) the best pen of freezers, (2) best pen of lambs for slaughtering.

Mr. A. W. Milbourne, at Warracknabeal, who has also a large area of the grass, supplies the following figures of its carrying capacity. The rainfall at Warracknabeal was even lighter than at Minyip.

The property comprises 1,200 acres, of which 150 acres are in crop, 150 acres fallow, 50 acres house and horse-paddocks, leaving 850 acres in Wimmera Rye Grass.

Since last shearing-time 900 four and six tooth ewes have been maintained, and these, together with 630 lambs, have been carried until the second week in October, when 1½ trucks of dry sheep, averaging 38s. 6d. in the wool, were sold. At the end of October a start was made to dispose of the lambs, which were in prime condition. They started at 19s., and trucks having been ordered, consignments were sent away on a falling market, so that the average price realized was only 15s. 6d. Subsequently a further truck of ewes was sold off shears. They were very fat, and averaged 17s. 6d.

The 600 remaining ewes are in prime condition, and can be carried over the summer and autumn without hand-feeding.

The effect of the grass upon the wheat crop that follows it is an important point, and enough has been stated in previous reports to warn farmers that it is believed to present some difficulty in controlling on the fallow. These points, and the exact carrying capacity under controlled conditions, are now being tested at the State farms. Mr. Milbourne's crop this year is stated to average about five bags.

In conclusion, I wish the society success in its efforts to improve the farming methods of the district, and respectfully commend to its attention the valuable work which might be done by properly conducted farm competitions in raising the standard of home comforts on the farms in the district.

A fertile and prosperous district like Minyip should possess a greater proportion of up-to-date homes with gardens. A well-housed community is a contented and a permanent one, and a countryside dotted with comfortable homes nestling among shady trees lessens the lure of the city.

I have to thank the secretary, Mr. Heckle, and Mr. Wylie for their courteous assistance during the work of judging.

POULTRY PARASITES.

By A. V. D. Rentoul, N.D.D., Chief Poultry Expert, and H. F. Clinton.

External Parasites.

Domestic poultry are frequently infested with a number of species of external parasites such as lice, mites, and ticks, which by their increasing numbers and by the effects of irritation cause considerable discomfort to their unfortunate hosts. Chickens so affected mature slowly and become liable to many ailments whilst in a weak condition.

Laying hens grow thin, their egg production is reduced considerably, and the flesh of table birds becomes poor in quality. There is also every possibility of the parasites carrying and distributing disease-producing organisms. Examination of the birds themselves, and also of the sheds, for vermin is too often neglected, and the cause of the unhealthy condition of fowls is often not ascertained until after considerable loss has occurred. Prevention is always better than cure, and constant attention and cleanliness are the only means of keeping vermin in check. Houses should be regularly sprayed with kerosene emulsion or carbolic solution, and nests, perches, &c., frequently examined and treated.

Some general details are given below regarding those specimens more generally met with in domestic fowls.

Mites.

Mites belong to the group Acarina and are spider-like insects, and in the adult stage are provided with four pairs of legs. The mouth parts are adapted for piercing and sucking. Some attack the birds only at night (red mite) while others, such as scaly-leg mite, are permanent parasites.

Red Mite, *Dermanyssus gallinae.*—When full grown these mites are about one-sixteenth of an inch in length, the colour ranging from whitish-yellow to deep red when engorged with blood. They are nocturnal in their habits, attacking the birds at night and remaining during the day-time in cracks or crevices of the perches, nests, or houses. Owing to their habits they frequently escape observation, although their presence causes the birds considerable irritation and consequent loss of sleep. The ova are deposited in the hiding places of the mites and hatch out in from five to seven days, several generations occurring during the season. Although not hard to kill, great difficulty is often experienced in getting at their hiding places, consequently sheds, perches, &c., should be as free from cracks, &c., as possible. Spraying should be thoroughly done by means of a well-penetrating fine-mist spray.

Scaly Leg Mite, *Sarcoptes mutans.*—These mites live and multiply under the epidermic scales of the legs and feet, and soon set up an irritation that causes the scales to lift up and separate. Rough crusts are formed, becoming larger as the mites multiply and gradually the feet present a deformed appearance, which, if neglected, will ultimately cause lameness, and it will be only with difficulty that the bird will be able to perch. The mites may be so readily transferred from one bird

to another that prompt treatment is imperative. The crusts may be softened by a soaking in warm soapy water, and the scales removed by scrubbing with a nail brush, care being taken that bleeding does not ensue. One of various ointments, such as sulphur and lard, kerosene and lard, or carbolized vaseline, may subsequently be applied, the treatment to be repeated after a lapse of three or four days.

Depluming Scabies, *Sarcoptes laevis.*—This parasite usually commences on the rump and spreads to the neighbouring parts. It is transmitted from one bird to another and its presence may be easily recognised by the scanty and miserable condition of the plumage. Affected birds should be isolated and given a dressing of sulphur ointment.

Lice.

Unlike mites and ticks, lice live permanently on their hosts and if allowed to increase, cause considerable itching to the birds. They belong to the group termed *Mallophaga,* the members of which are provided with mouth parts fitted for biting the feathers and scales of the skin; they are quite distinct from the sucking lice which attack animals Lice breed rapidly, the eggs (or nits) being laid on the feathers, and they hatch out in from seven to ten days.

Amongst various remedies for destroying lice, dipping the bird in sheep dip or other solutions containing carbolic acid has been recommended, but this method requires to be quickly and carefully done, as the effect on the bird is rather severe. The best and most natural remedy for keeping these parasites in check is to provide the birds with a dust bath, consisting of fine dust, sand, wood ashes, and flowers of sulphur. Individual birds that are badly affected may be dusted with insect powders around the vent and under the wings. The species of lice most commonly met with are as follows:—

Menopon pallidum, the small body louse. This species is the commonest and most injurious louse found on the fowl. It is of a pale yellow colour and is about one-sixteenth of an inch long.

Menopon biseriatum, the large body louse. It is also a common species on both fowls and turkeys. It is somewhat similar in colour and habits to the small body louse, but is larger, and its head is more angular in front.

Lipeurus heterographus, the head louse of both fowls and chickens. It is found on the head and neck hackle and is at times very troublesome to young chickens. It is about one-twelfth of an inch long, and is grey in colour, with black markings.

Lipeurus variabilis, the wing louse of the fowl. This species somewhat resembles the head louse in size and colour, but may be distinguished from the latter by its rounded head and narrower body. Although found mostly on the primary wing feathers, it is also found on the neck hackles and tail.

Goniodes stylifer, large turkey louse. This is often found in large numbers on various parts of the body. It is usually about an eighth of an inch long, and its colour deep brown.

Poultry Tick.

The poultry tick—*Argas persicus*—has been reported as attacking poultry from various parts of the world, including Australia, more generally in the warmer latitudes. This pest is somewhat similar in habit

to the bed bug, the adult tick hiding in crevices and cracks of the houses and perches during the day-time, visiting the birds at night in order to suck blood. They are found in all stages from the small six-legged larva, up to the adult tick with eight legs. They are oval in shape, flattened with thin margins, pitted on the dossal surface, and of a greyish-brown colour. The eyes are absent. The eggs are laid in the crevices of the houses and perches, sometimes even on the bird itself. Poultry tick are very tenacious of life, and have been known to exist for three or four years without food. When the presence of tick is suspected, a through inspection should be made underneath the perches, &c., and the blade of a knife, or chisel passed between the cracks and

Wing Louse of the Fowl.
(*Lipeurus variabilis.*)

Small Body Louse.
(*Menopon pallidum.*)

(Both very highly magnified.)

crevices. When tick are present the knife or chisel will come out smeared with blood. The Quarantine Act requires that all outbreaks be reported at once to the Chief Veterinary Officer, Department of Agriculture, Melbourne. In tick-infested areas all fowl houses should be constructed of iron with the woodwork on the outside if possible, and they should be built well away from any other structures. Pepper trees with their loose bark are found to harbor large numbers of these pests.

Poultry tick is responsible for the transmission of *Spirochaetosis*, or tick fever in fowls; the presence of the blood organism causing this disease is determined by microscopical examination. According to Dr. Pearl, the disease has not yet been reported in the United States, although known in South America and other countries.

The symptons of the disease are—general dullness, loss of appetite and thirst; the birds stand with head and tail down and eyes closed, and a rise of temperature takes place; diarrhoea is present, and pronounced anæmia. *Post-mortem* examination shows enlargement of the liver and spleen. The crisis of the disease occurs on the fourth or fifth day. In fatal cases the fever disappears and the temperature sinks to below normal shortly before death. The disease is caused by a spirochæte (*Spirochæta gallinarum*), found in the blood, the liver and the spleen. According to Levaditi and Manouelian a favorable turn at the crisis of the disease is brought about by the destruction of the parasites by the large leucocytes of the spleen and liver.

Goniocotes gigas (Very highly magnified.)

This parasite is not common, and is reproduced only because of its striking difference from those illustrated on the opposite page.

The organisms are carried from one fowl to another by the tick Argas. According to von Prowazek, the tick is a true intermediary host, the organisms appearing in the salivary glands about fourteen days after infection. The organism may live in the body of the tick for seven or eight months. That the tick is not a necessary host is shown by the fact that injection of the blood of an affected fowl can produce the disease in a healthy fowl.

Internal Parasites of Poultry.

Gape Worm—*Syngamus trachealis*.—The worm is at times called the Y or forked worm. The mouth parts are surrounded by a capsular arrangement with which they attach themselves firmly to the trachea (or wind pipe). The mouth parts are provided with chitinous teeth,

with which they wound the mucous membrane, and from this wound they suck blood. The female produces eggs which escape from her body and the embryos are taken up by earth worms. Chickens drinking contaminated water or eating the infected worms are in turn affected. The embryos migrate to the air passages and grow to maturity.

Symptoms.—Birds find difficulty in breathing and after a time gasp for breath, extending the head high into the air.

Treatment.—A feather dipped in turpentine may be pushed down the trachea and should be twisted round a few times before being withdrawn. Another method is to put the birds in a box and then blow lime into the box. The birds will be partially choked and cough up the worm. The box should afterwards be burned.

Tape Worms.

Tape worms require an intermediate host such as an angle worm, snail, or insect. The anterior end of the tape worm possesses a number of hooks or suckers by which it attaches itself to the walls of the intestine. Behind this head the entire animal consists of a long series of segments. The segments nearest the head are the smallest and it is at this region that new segments are constantly being formed. The farther they are from the head the larger the segments become. Towards the posterior end of the worm the segments develop sexual organs and later become filled with eggs.

As soon as the eggs are fertilized and mature, the segment containing them drops off, and is voided with the fæces of the host. Each segment of this kind contain thousands of eggs. If they are to develop further, they must be swallowed by some intermediate host, such as a worm, snail, or insect. The egg then hatches a six-hooked embryo which bores its way from the intestine into the body cavity of the intermediate host. It here develops into a larval form known as a cysticercoid.

When the intermediate host is eaten by a chicken, the larva continues its development and forms the adult tape worm. Epsom salts and oil of turpentine are an excellent remedy, but care must be exercised to ascertain that the "head" of the worm is voided, and the excreta should be carefully burned.

Round Worms.

These are far more common than many people have any idea of, and when numerous in any bird, they affect digestion and lessen nutrition, whilst by irritation of the intestine they cause stubborn diarrhoea. Ova, microscopic in size, pass from the fowl to the ground, and other birds become affected by drinking or eating in places soiled with the excrement of affected birds. The symptoms are general lassitude with emaciation, and at times ravenous appetite.

Treatment.—Keep yards and house clean, lime the floors and yards and disinfect food troughs, and water vessels daily. Five to ten grain doses of areca nut may be mixed with the soft food, and will act as a cathartic as well as a parasiticide. One grain doses of thymol or two grain doses of santonin have also proved effective in ridding the birds of worms.

FARM NOTES FOR APRIL, 1920.

STATE RESEARCH FARM, WERRIBEE.

H. C. Wilson, Manager.

The Season.

In common with most other agricultural districts of this State, Werribee is suffering from a very dry seeding season. The rainfall for the first four months of this year has been as under:—

January	125 points.
February	30 points.
March	77 points.
April (light rain recorded on 14 days of this month)	126 points.
Total	358 points.

There has been insufficient rain to date to start any of the native root-grass pastures, and, in consequence, stock are being maintained mainly by hand feeding and grazing on irrigated lucerne and grass areas. The stubbles for the sheep, which were light this year, have been stocked heavily and eaten out. These areas, in a normal season, would have been sufficient to maintain the 650 flock ewes, which are now lambing; but it has been found necessary to use portion of our irrigated areas to supplement the grazing of the stubbles. Good soaking rain is badly needed, both for insurance of a fair seeding season, and future stock prospects.

Seeding.

Cultivation of the fallows of the farm, some 650 acres in extent, was proceeded with through the months of January, February, and March, and this month 300 acres were sown with shandy hay, as follows:—45 lbs. of Yandilla King graded seed wheat, mixed with 1 bushel of Algerian oats, together with 120 lbs. of superphosphate per acre. Heavy harrows preceded and followed the drills during these operations, and the fields are now being rolled to ensure an even surface for the binder at harvest time. The germination to date of the earliest of these areas is very unsatisfactory, green patches only showing above the surface. Some fear is felt for the wheat in this mixture, as in previous years partial failure has resulted through malting and mould under these conditions. This is not the case with the oats, as they undoubtedly seem to be more resistant to malting or mould. This, it is claimed, is one of the great advantages of sowing the shandy mixture for hay. If the wheat partly fails, the resultant crop will have a greater proportion of oats than would have resulted under good conditions; but the crop will not prove by any means the failure that would have been the case had wheat been sown alone as a hay crop. Shandy mixture for hay proves to be a very valuable balanced ration for horses or dairy herds, and is relished much more than either of these two cereals sown separately as hay. Sixty acres of oats for seed have also been sown on fallow, but no germination is yet noticeable.

On the 27th of May. a start was made in sowing our seed-wheat areas and wheat experimental plots on well-prepared fallows. This

is the critical time with us, as we are solely dependent on the rainfall, and to insure a good germination a fall during the first fortnight of May is essential. The fallowed areas, though very fine in texture, are exceptionally dry, and the seed-wheat is being pickled with ½ per cent. solution of formalin, and allowed to dry thoroughly before sowing. Care is being taken by the drill operators to plant as close to the surface as possible, so that the possibilities of serious malting before rain falls will be minimized. Sixty-five pounds of late wheats, such as Yandilla King and Warden, are now being sown with 120 lbs. superphosphate per acre. It has been found necessary in past years to sow these late wheats early with heavy dressings of seed to obtain the best results. Such wheats as Federation, Gallipoli, Currawa, Major, Marshall's No. 3 —known as midseason's wheats—will be sown next with 60 lbs. of seed and 120 lbs. of superphosphate per acre.

Rape.

A field of 60 acres of rape, sown early in the month as a catch crop on land which was intended as a fallow this season, has not proved to be the success that was anticipated. Owing to the dryness of the autumn, the germination was rather poor, and success, in a measure, depends upon a quick germination and growth of the crop in the early autumn months. However, it has been our practice in the past to re-seed these rape fallow areas in August if the autumn crop proves to be a failure. This has been done in past years with rather marked success. Four pounds of Dwarf Essex rape, and 56 lbs. of superphosphate, is sown to the acre, care being taken not to leave the seed mixed with the fertilizer any longer than is absolutely necessary, as the germinating power of the rape will be affected by long contact.

During late March and early April, 200 acres of stubble land were ploughed and worked down in preparation for seeding Cape barley. These fields will be left until rains fall and weeds have germinated, and then finally worked with disc-cultivators, and sown in June with 65 lbs. barley, and 1 cwt. superphosphate per acre.

Barley-growing in this district has proved to be profitable, and it is the only grain crop that seems to give payable results when sown on ground which has not been fallowed, and which has carried a crop of wheat or hay the previous year. An effort is being made this season to sow areas of pure-seed barleys, both of the feed and malting varieties, on clean land. If successful, the resulting seed will be available for distribution next season.

Lucerne Harvesting.

The lateness of the lucerne harvesting has been phenomenal this season. First-quality lucerne hay has been harvested throughout the month; while the last of our areas are now being cut, and promise, even at this late stage, to yield up to a ton per acre. The growth on the irrigated fields, owing to the dryness and warmth of the autumn, has been exceptionally good, and the harvesting has been extended some weeks longer than has been our custom since the inception of the farm. With a view to ascertaining the loss of weight in a stack of lucerne hay, weighings have been made during the month which prove that if the lucerne, when stacked, contains the right quantity of moisture to insure its thorough curing, very little loss occurs through stacking.

Fifty-one tons of lucerne hay, with a moisture content of approximately 18 per cent., were stacked at the farm during the month of November. Four months later, it was baled, and again weighed. The total loss of weight was 1 ton 6 cwt. Some part of this loss, of course, may be credited to baling operations, and approximately 2½ per cent. loss of weight can be reckoned on after four months in the stack.

Live Stock.

In view of the Royal Agricultural Society's efforts to organize a show of live stock during the middle of May in honour of His Highness the Prince of Wales, efforts are being made on the farm to get into show condition representatives of the different sections of Red Poll and Friesian cattle, Clydesdale horses, Suffolk and Border Leicester sheep that were successful at the last Royal Show.

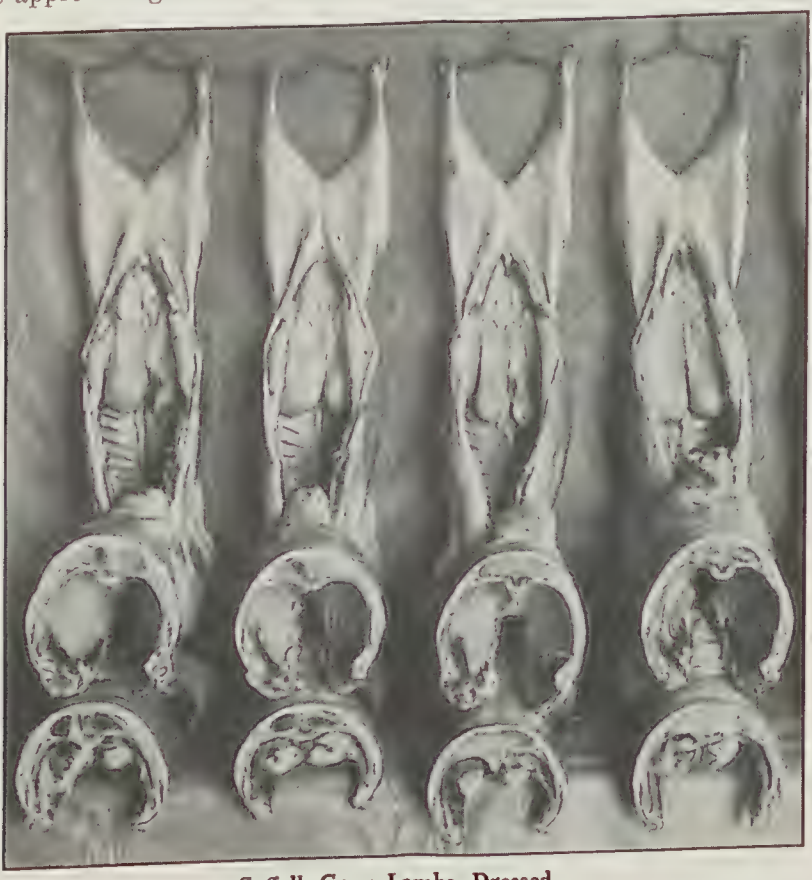
Horses.—Owing to a large number of young Clydesdale fillies and geldings, which are a result of our stud breeding here, we are now heavily stocked; there are 108 head of all ages. Of these, 25 yearlings

A 104-ton Stack of Lucerne at State Research Farm, Werribee.
(Built this Season.)

by the Clydesdale stallion Major Oates, and 18 foals by the Clydesdale stallion Baron Wigton, are being grazed on the irrigated areas; while 10 rising three-year-olds are about to be handled and broken in for work during the seeding. This heavy stocking is taxing the resources of the farm in such a dry season, but there is no scarcity of fodder reserves. The cost of feeding working horses at the present time, allowing for the actual value of the food on the farm, is, approximately, £1 per head per week. This allows a ration of 30 lbs. of shandy chaff, 7 lbs. lucerne chaff per diem, and on this amount heavy draught horses in full work will maintain their condition if driven by careful drivers, and shown other necessary attention.

Cattle.—Forty-eight Red Polled and 6 Friesian are now being milked in the dairy. The milk yield averages, approximately, 140 gallons per day. This includes the yield of heifers and cows that are being dried off. The ration of the herd consists of 14 lbs. of lucerne and barley silage, 12 lbs. of lucerne hay, and 8 lbs. of bran per day per cow. In

addition to this, the cows are grazed on irrigated lucerne for upwards of two hours daily. There are also on the farm 16 young and 4 aged bulls, 14 heifers, and 10 dry cows, giving a total, with milkers, of 104 head. The health of the whole dairy herd has been excellent during the month, and the milk yields have not appreciably lowered through the approaching winter.



Suffolk Cross Lambs, Dressed.

Sheep.—The number of sheep carried on the farm is as follows:—

Merino Lincoln cross 4-year-old ewes, now lambing to Suffolk and Border Leicester rams	640
Suffolk cross weaners	30
Suffolk stud	80
Border Leicester stud	260
Mixed sheep for rations	20
Total	1,030

With a view to the production of suitable fat lambs for the early markets, 8 Suffolks and 8 Border Leicester two-tooth rams were joined with 600 four-year-old Merino Lincoln ewes in the first week of November last year. The ewes are now lambing fast, and, fortunately,

we are in a position, owing to our irrigated areas, to maintain them in the condition that is necessary to enable them to suckle their lambs well. If these lambs thrive as expected, we shall have the first truck available for market towards the end of July, when there will be very few of this season's lambs offering for sale. This early lambing can be practised with success only where there are good prospects of succulent feed, either natural or under irrigated conditions, available for the ewes from the month of April onwards.

Proposed Work for the Month of May.

1. Seeding proceeded with, mainly wheat and oats.
2. Rolling sown fields, and preparation for binder.
3. Cultivation of areas green ploughed in the months of March and April, in preparation for barley seeding, when the season takes a favorable turn.
4. Ploughing 200-acre field to be treated as a rape fallow.
5. Maintenance of farming routine and improvement work.
6. Attention to stock and dairy herds.
7. Seeding experimental fields.
8. Completion of lucerne hay harvesting.
9. Channelling new area of 80 acres sown to lucerne.
10. Cultivation before and after drills throughout the seeding.

NOTES ON EXPERIMENTAL WORK, MARCH, 1920.

George S. Gordon, Field Officer.

Seasonal Conditions.

The dry weather experienced in February was continued in March. Only 77 points of rain were recorded for the month. This amount was made up of seven small showers, the heaviest of which registered only 37 points. Consequently, the rain was of little use to growing crops, or for obtaining a quick start for early-sown seed.

Early Seeding.

In view of the large amount of seeding to be got through on the experimental areas this year, it was considered advisable to commence sowing in spite of the dry autumn. In the green manurial field, the rape, barley, and oat plots for feeding off and ploughing in, and the rape, pasture, and hay plots in the permanent rotation field have been sown. A mixed crop of Algerian oats and dun peas has also been seeded in the section of the manurial field which was under wheat last year. Although in the manurial field these plots were sown without fertilizers in order to obtain further definite information regarding the availability of the fertilizers to crops succeeding those to which they were applied, the change of crop to oats and peas will also serve as a rotation or suitable break in the wheat crops which have been treated with various fertilizers, and sown in alternate years on bare fallow. Despite careful fallowing, early sowing under dry conditions generally leads to more or less "dirty" crops; this is because there is not sufficient moisture in the immediate surface to germinate such seeds as those of cape weed, &c., until the rain occurs, which also germinates the seed of the sown crop. Both crop and weeds then start into growth at the same time.

and the judicious use of a light harrow is necessary to check the growth of the latter. On the other hand, when late summer rains have fallen, or the autumn "break up" occurs early enough to germinate the seeds and permit of the young weeds being killed by cultivation prior to seeding, clean crops result.

Early crops have the following advantages over late ones:—

1. The early growth is much more vigorous and rapid because the soil still retains some of the summer warmth.
2. By the time the cold of winter comes on, the plants have their roots well down in the warmer layers of the subsoil, and are, therefore, better able to stand frosts and cold wet weather than late crops, which are then struggling to grow in the cold surface soil.
3. The longer growing period, and consequently better root development, enables the plant to obtain more moisture and plant food during the ripening period of the succeeding summer.
4. Early crops may often be grazed with advantage when the ordinary pasture is scarce. If the season has induced such a rank growth that there is a possibility of "lodging," or the crop is so forward as to be in danger from late frosts, this is the best method of checking it.

THE "BEST" AGRICULTURAL PRACTICE AT WERRIBEE.

In view of the urgent necessity for increasing production, and to meet inquiries for concise information as to which is the "best" variety, "best" manure, &c., as shown by the results obtained from the experimental plots at Werribee, these points are briefly summarized below. It is not suggested that these results are necessarily applicable to the whole of Victoria without modification to suit local conditions, but there is no doubt they do apply to a large portion, and are of value, in a comparative sense, to the whole State.

1. The best varieties of wheat during the past five seasons at Werribee were—

   (*a*) Gallipoli (new crossbred 4071, Club x Yandilla King).
   (*b*) Marshalls No. 3.
   (*c*) Graham (new crossbred, Indian x Comeback).
   (*d*) Major.
   (*e*) Currawa.
   (*f*) Yandilla King.
   (*g*) Federation.
   (*h*) Warden (the best hay variety).

2. The best varieties of barley were—

   (*a*) Roseworthy Oregon } Six-rowed or feed types.
   (*b*) Cape }
   (*c*) Pryor (the best two-rowed or English malting type).

3. The best variety of oats was—

   Algerian.

4. The best manure was—

   Superphosphate.

5. The best quantity of superphosphate to apply was—
140 lbs. per acre.

6. The best time to sow was—
(*a*) Oats, early (March and April).
(*b*) Wheat, early (May).
(*c*) Barley (May and early June).

NOTE.—Late (or slow maturing) varieties should be sown first. Early (or quick maturing) varieties should be sown last. Hence barley, being a quick-growing cereal, is the last to be sown.

7. The best results have been obtained from plump-graded seed of first quality. The quantity to sow varies somewhat with the variety, purpose for which the crop is intended, season, and time of sowing. The earlier the sowing the less seed is required, providing the seed bed is clean.

NOTES ON EXPERIMENTAL WORK, APRIL, 1920.

Plant Breeding.

The final laboratory examination of the plants which were roughly selected in the field before harvest has been completed, and those selected for further trial have been individually recorded, thrashed, and prepared for sowing. A representative head from each selected plant has been kept for reference, and as an insurance against possible failure of the seed to be sown. The plants retained for sowing comprise crossbreds, and selections from standard varieties of wheat, barley, oats, and flax; and this year the number runs into larger figures than usual. These may be summarized as follows:—

		Plots.
A.—Standard varieties of wheat	180	
" " barley	40	
" " oats	25	
" " rye	1	
		246
B.—First generation crosses, made during 1919 (wheat, barley, oats, and rye)	83	83
C.—Wheat, second generation crossbreds	88	
" third " "	1,389	
" fourth " "	285	
" fifth " "	64	
		1,826
D.—Barley, second generation crossbreds	99	
" third " "	342	
" fourth " "	20	
		461
E.—Oats, third, fourth, and fifth generation crossbreds	37	37
F.—Gallipoli, and other wheat selections	197	197
G.—Flax selections for fibre and seed	154	154
Total		3,004

In addition to these, a number of drought-resistant varieties collected in Palestine by Major Cherry, promising crossbreds from South Australia, and rust-resistant varieties from America, will be sown. The whole of these plots will be sown by hand, and will cover an area of about 9 acres. The grain is dropped at ½-link spaces, in rows 4 links apart, with check rows of Federation, or other suitable standard varieties, in every tenth row for comparison of growth and yield. Selections from the third, fourth, and fifth generations, which are "fixed," or true to type, and compare favorably with the check rows, are grown in larger plots, known as "Long Rows," in the succeeding year. Over 400 such crossbreds and selections have survived the test in last year's plots, and the seed from these has been graded and prepared for sowing in this year's "Long Row" section.

FOX GUARDS FOR SHEEP.

By H. W. Ham.

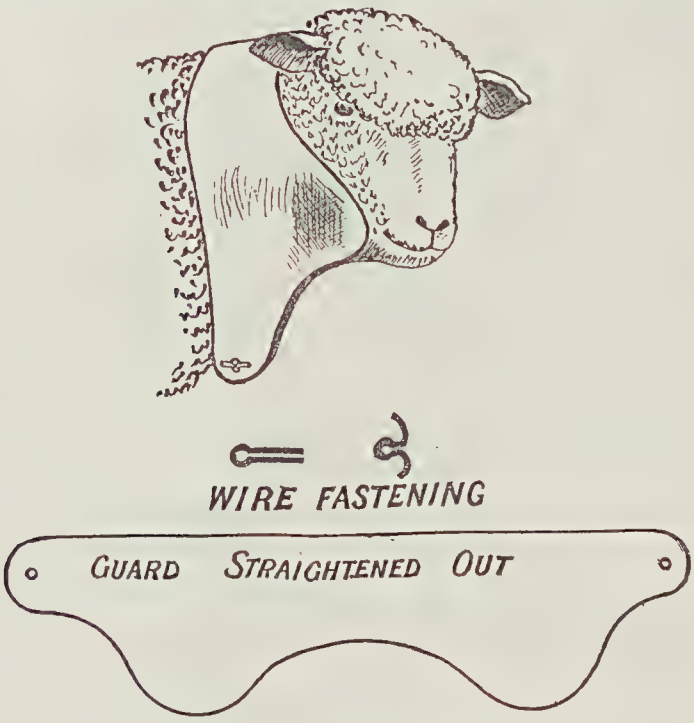
In most flocks the loss of a percentage of lambs must be looked for as the result of inward defects and malformations, but probably more are lost through the ravages of foxes. Very close observation is necessary, as a rule, for a farmer to make sure that foxes are attacking his lambs, for the habitual lamb-killing fox does his work so neatly and cleanly that it is only by close inspection that the fang marks can be noticed through the short wool of the dead lambs. The surest method of proving whether a lamb has been killed by a fox is to open the skin at the neck close to the head, and if the punctures can be seen on each side of the throat, through the jugular vein, the owner can be assured that it is the work of a fox. The flesh of lambs killed in this way will usually be quite white and clean.

The method of the most cunning dog foxes is to move about the ewes until a lamb is found sleeping, or until one, awaking suddenly, runs towards the fox, as they sometimes will towards a horseman or shepherd, or other moving object.

Foxes have been seen in the early morning tossing a lamb over and gripping it close to the jaws underneath close up to the ears (not over the back of the neck as many suppose). One full-blooded lamb will often satisfy a fox, but occasionally he will kill two. When the lambs become stronger they will sometimes fight themselves free, and perhaps be found next morning showing signs of their struggle on the nose and throat.

The guard illustrated has been designed to protect young lambs. It will cover the vital parts around the neck, and yet allow the lamb to raise its head to suck and to lower it to eat grass. Guards of this pattern may be cut from pieces of tin, and should be made in varying sizes—the smaller for Merinos and larger for Lincolns or Border Leicesters. They should be cut about 2 inches wide at the back of the neck on top, and 3 inches or a little more below. A guard may be

fastened together with fine wire, made in the form of a staple, which, when placed in position, should be turned up after the manner of staples in fencing droppers. If a certain gauge of copper wire be used, it will



FOX GUARDS

be found in cases of rapid growth of a lamb to pull out gradually, and the collar will then drop off. It is, however, preferable to remove them after six or eight weeks, and put them by for use again.

PLANTING AND RECONSTITUTION OF VINEYARDS.

Conditions Governing the Distribution of Phylloxera-Resistant Vine Rootlings and Cuttings.

The conditions subject to which Victorian vine-growers may purchase phylloxera-resistant vine cuttings and rootlings (grafted and ungrafted) from the State Vine Nursery, at Wahgunyah, have been drawn up for the current year, and copies of same will shortly be available on application.

The price at which these vines will be supplied has been recently considered by Cabinet, and the Government has decided to make an increase on last year's prices as specified below.

As regards the grafted rootlings, the increased price will only apply to the 1921 delivery; there will be no alteration for those to be delivered during the coming winter, for which contracts were entered into before 30th June last.

The increase will, however, apply to ungrafted rootlings and cuttings for delivery during the coming season.

It is felt that growers will realize that the increase is reasonable, if only on account of the higher cost of everything used in connexion with the Nursery, and the consequent increase in the expenditure necessary to continue the subsidy to the industry which is involved in the scheme for the supplying of phylloxera-resistant rootlings. Since 1914, when prices were last fixed, wages for casual labourers have increased from 7s. to 10s. per day.

Even at the increased price, vines are being supplied to intending planters at considerably below the cost of production.

In other respects, with the exception of the necessary corrections of dates (substitution of 1920 for 1919, &c.), no alterations have been made.

The time within which applications will be received remains as it was last year, as will be seen below. Applicants are required to finally decide, when filling in their application forms, as to their stock and scion requirements; no amendment can be permitted later.

It will suffice here to explain that resistant vines are supplied to intending planters in any of the following forms, and at the prices stated; packing extra in the case of consignments forwarded by rail:—

Resistant rootlings, grafted with scions previously supplied by applicants, at per 1,000, £9.
Resistant rootlings, ungrafted, at per 1,000, £2.
Resistant cuttings, at per 1,000, £1.

Application Forms.

No application will be entertained unless made on the forms supplied for the purpose, which are obtainable from the Director, Department of Agriculture, Melbourne, or from the Principal, Viticultural College, Rutherglen.

Separate forms are provided for (*a*) Grafted Rootlings (green form); (*b*) Ungrafted Rootlings and Cuttings (yellow form). Applications must be filled in on the proper forms.

Each applicant for forms will be supplied with a copy of the detailed conditions governing the distribution of phylloxera-resistant vine rootlings and cuttings.

Applicants are earnestly requested to thoroughly familiarize themselves with these. *They are warned that under no circumstances can any departure be permitted from the regulations governing the distribution as detailed therein, nor can any request for special consideration be entertained.*

Dates before which Applications must be made.

For Grafted Rootlings (1921 distribution, June to August inclusive), applications will be received until 30th June next. (For the 1920 distribution the time for receiving applications closed on 30th June, 1919, and present applicants cannot be supplied until 1921.)

For Ungrafted Rootlings, to be distributed from July to August, 1920, inclusive, applications will be received until 31st July, 1920.

For Cuttings (see conditions), applications will be received until 30th June, 1920.

Supplying Clean Districts.

The nurseries in which grafted rootlings are raised being situated in phylloxerated districts, these cannot be supplied to growers in clean districts. To do so would be manifestly unfair to owners of existing vineyards in such districts.

A limited number of clean resistant cuttings are, however, available, and these can be supplied to applicants from clean districts.

RAINFALL IN VICTORIA.

First Quarter, 1920.

District.	—	January.	February.	March.	Quarter.
		Points.	Points.	Points.	Points.
Mallee North	Mean	15	10	14	39
	Normal	65	86	98	249
	Per cent. Departure	−77	−88	−86	−84
Mallee South	Mean	7	1	17	25
	Normal	59	93	96	248
	Per cent. Departure	−88	−99	−82	−90
North Wimmera	Mean	10	2	72	84
	Normal	56	90	103	249
	Per cent. Departure	−82	−98	−30	−66
South Wimmera	Mean	17	6	99	122
	Normal	74	87	110	271
	Per cent. Departure	−77	−93	−10	−55
Lower Northern Country	Mean	12	0	18	30
	Normal	95	93	118	306
	Per cent. Departure	−87	−100	−85	−90
Upper Northern Country	Mean	19	1	27	47
	Normal	116	102	138	356
	Per cent. Departure	−84	−99	−80	−87
Lower North-East	Mean	51	3	115	169
	Normal	157	143	220	520
	Per cent. Departure	−68	−98	−48	−68
Upper North-East	Mean	163	1	296	460
	Normal	230	194	277	701
	Per cent. Departure	−29	99	+7	−34
East Gippsland	Mean	856	31	250	1,137
	Normal	269	217	255	741
	Per cent. Departure	+218	−86	−2	+53

RAINFALL IN VICTORIA—*continued.*

District.	—	January.	February.	March	Quarter.
		Points.	Points.	Points.	Points.
West Gippsland ...	Mean	174	68	305	547
	Normal	226	168	284	678
	Per cent. Departure ...	−23	−60	+7	−19
East Central ...	Mean	97	91	280	468
	Normal	251	157	279	687
	Per cent. Departure ...	−61	−42	0	−32
West Central ...	Mean	79	24	114	217
	Normal	130	125	213	468
	Per cent. Departure ...	−39	−81	46	54
North Central ...	Mean	52	14	61	127
	Normal	128	134	181	443
	Per cent. Departure ...	−59	−90	−66	−71
Volcanic Plains ...	Mean	40	27	157	224
	Normal	121	115	178	414
	Per cent Departure ...	−67	−77	−12	−46
West Coast ...	Mean	59	64	245	368
	Normal	132	126	195	453
	Per cent. Departure ...	−55	−49	+26	−19

N.B.—100 points = 1 inch.

H. A. HUNT,
Commonwealth Meteorologist.

ORCHARD AND GARDEN NOTES.

E. E. Pescott, F.L.S., Pomologist.

The Orchard.

CULTIVATION.

Cultivation work should be well on the way by this time. The ploughing should be advanced, so as to leave plenty of time for other orchard work. Autumn ploughing may be rough, but care should be taken to plough to the trees, so that a drainage furrow is left between the rows.

Manuring.

It is just possible, where heavy crops have been carried, that a top dressing of stable manure will be required to add humus to the soil. The fertility of the soil must be maintained; and, although stable and chemical manures as a general rule are of undoubted value as tree stimulants, well-cultivated and thoroughly tilled land will always carry fair crops with far less manure. Further, if the orchard land is well drained, cultivated, and sub-soiled, any manures that are used will be far more beneficial to the trees. The more suitable the conditions that are given to the trees, the better they can appreciate and assimilate their food.

Perhaps the most useful and valuable of manures is stable manure. It is of great use, not only as a manure and as an introducer of necessary bacteria into the soil, but its value in adding humus to the soil is incalculable. Organic matter, such as stable manure, introduced into the soil quickly becomes humus; this greatly ameliorates and improves soil conditions. It is impossible to say what quantity of stable manure is necessary per acre; that can be determined only by circumstances. Orchards in different climates and varying soils will require differing quantities. A too liberal use of stable manure will be over-stimulating in most cases, and at all times an excess beyond what is necessary for present use will only be waste, as humus is readily lost from the soil, once it is in an available food form.

It has been pointed out in these notes previously that an improved physical condition is far more profitable to the fruit-grower than the continued use of manures. A tree will be far more productive if it is happy in its soil conditions; uncomfortable conditions will always result in unprosperous trees.

A dressing of lime, using about 4 or 5 cwt. per acre, is of great value in stiff or heavy orchard lands; and it may be given at this season. The lime, which must be fresh, should be distributed in small heaps between the trees, covered with a layer of soil, and allowed to remain for a few days before ploughing or harrowing in.

Pests.

The advice given last month for spraying should be followed, particularly where any oil emulsions or washes are to be used.

Orchards will benefit if an attack is now made upon the Codlin moth. All hiding places, nooks, and crannies, where the larvæ have hidden, should be thoroughly searched and cleaned out. The orchardist has far more time now to do this work than he will have in the spring time.

General Work.

Drainage systems should now be extended with as little loss of time as possible.

New planting areas should be prepared, and subsoiled or trenched wherever possible.

Vegetable Garden.

Weeds must be kept down in the vegetable garden. Weeds are generally free growing at this season; their growth is very insidious, and they will crowd out the young seedlings or plants in a very quick time. Hoeing and hand weeding must be resorted to, preferably hoeing. The frequent use of the hoe in winter time is of much benefit in the vegetable garden. A varied assortment of crops is now being produced; and if these can be kept growing much better crops will result. The soil quickly stagnates in the winter, and the only way to prevent this is to keep the surface stirred. Thus, a double service is performed with the aid of the hoe.

The application of lime is of great necessity at this season. In addition to amending unhealthy and unsuitable soil conditions, lime is particularly useful as an insecticide. It assists in destroying in immense numbers both eggs and insects that would breed and live in the ground ready to do damage to all classes of vegetable crops. Therefore, wherever possible, the soil should receive an application of lime. The garden should, as well, be manured with stable manure, but not for some weeks after the lime application.

Cabbage and cauliflower plants may be planted out; and seeds of parsnips, carrots, onions, peas, and broad beans may be sown.

Flower Garden.

The whole flower section should now be thoroughly dug over. All beds should be cleaned up, top-dressed with manure, and well dug. The light rubbish, such as foliage, twiggy growths, weeds, &c., may all be dug in, and they will thus form a useful addition to the soil. These should never be wasted. Only the coarser and stouter growths should be carted away for burning, and then the ashes may be used as manure. No part, whatever, of garden rubbish or litter need be wasted. In one form or another it should be replaced in the soil.

May is a good month for establishing new gardens, and for planting out. All deciduous plants and shrubs may now be planted. It is not necessary to dig a deep hole for planting. A hole in which the roots of the plant can be comfortably arranged, without crowding or cramping, will be quite sufficient for the purpose.

Continue to sow seeds of hardy annuals, including sweet peas, although the main crop of sweet peas should by this time be well above ground. Where there has been any overplanting, the young plants will readily stand transplanting, and this will greatly assist those that are to remain. Annuals should not be crowded in the beds. They require ample room for suitable development, and thus the seeds should be sown thinly or the plants set out a good distance from each other.

All herbaceous perennials that have finished blooming may now be cut down. Included amongst these are phlox, delphiniums, &c. If these are to remain in their present situation for another season it is always an advantage to raise them somewhat, by slightly lifting them with a fork, so that too much water will not settle around the crowns; they may also be mulched with stable manure, or the manure may be forked into the soil around the crowns.

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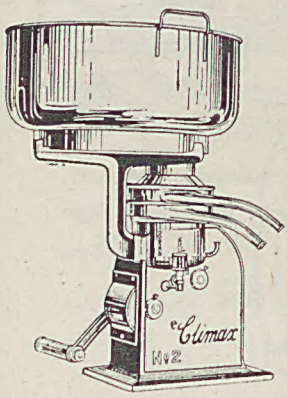

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from above strains are available.

Postal Order or Cheque should accompany Order, which should be addressed to the

MANAGER, RESEARCH FARM, WERRIBEE

SP